MENT OF THE INTERIOR
IRRIGATION BRANCH

REPORT OF THE PROCEEDINGS OF THE EIGHTH ANNUAL CONVENTION OF THE WESTERN CANADA IRRIGATION ASSOCIATION

HELD AT

PENTICTON, B. C.

August 17, 18 and 19, 1914

Published by the authority of the Hon. W. J. Roche
Minister of the Interior

OTTAWA
GOVERNMENT PRINTING BUREAU
1915

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Irrigation Intake Dam, Penticton Creek, B.C.

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Calgary, Alberta, 1907.

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Kamloops, British Columbia, 1910.

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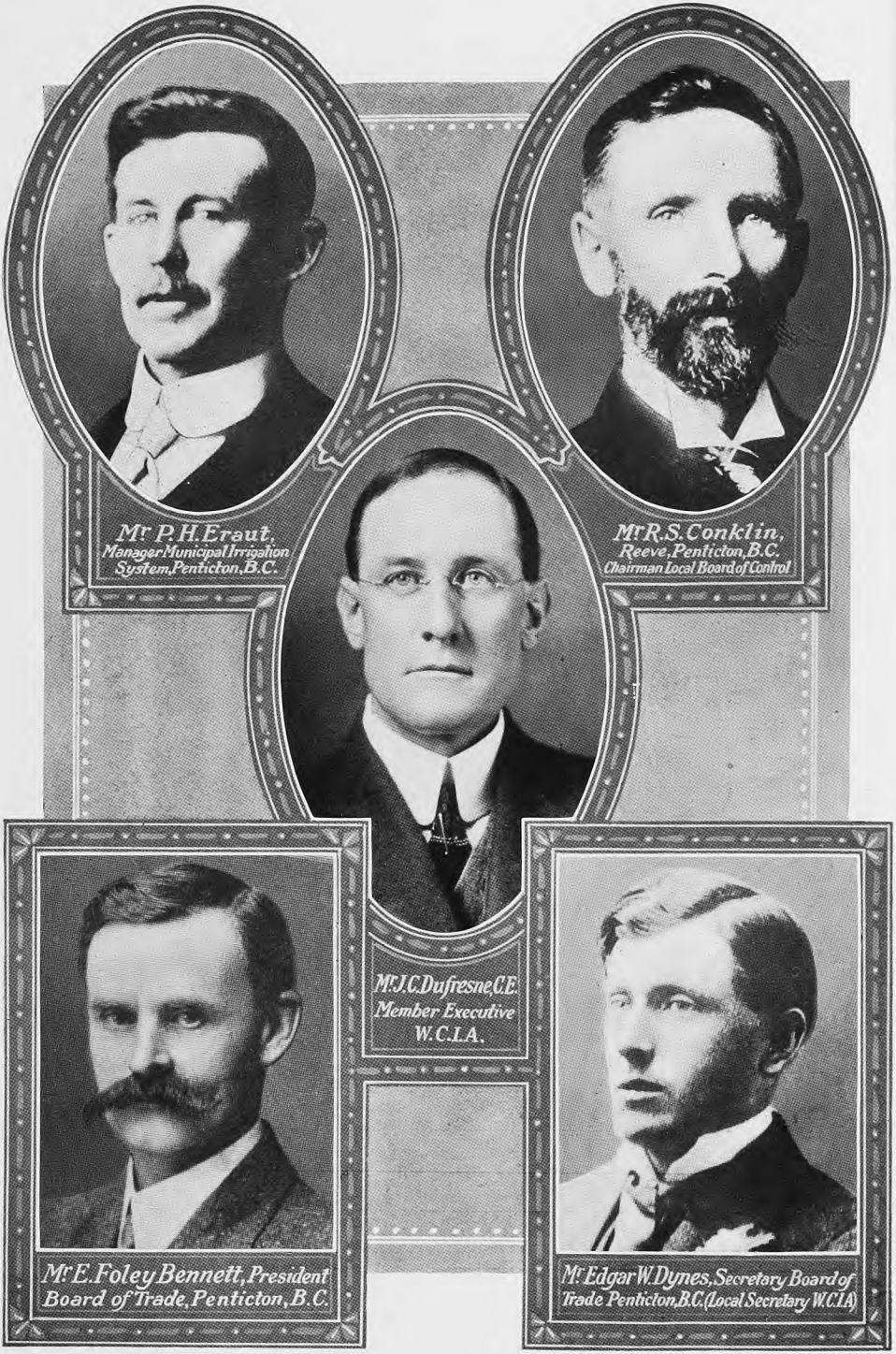
Kelowna, British Columbia, 1912.

Lethbridge, Alberta, 1913.

Honourable Dr. W. J. Roche, Minister of the Interior, Honorary President Western Canada Irrigation Association.



Mr P.H. Eraut,
Manager Municipal Irrigation
System, Penticton, B.C.

Mr R.S. Conklin,
Reeve, Penticton, B.C.
Chairman Local Board of Control

Mr J.C. Dufresne, C.E.
Member Executive
W.C.I.A.

Mr E. Foley Bennett, President
Board of Trade, Penticton, B.C.

Mr Edgar W. Dynes, Secretary Board of
Trade Penticton, B.C. (Local Secretary W.C.I.A.)

OFFICERS FOR THE YEAR 1913-14.

Honorary President—The Honourable W. J. Roche, Minister of the Interior, Ottawa.

President—Honourable W. R. Ross, Minister of Lands, B.C.

First Vice-President and Chairman of the Executive Committee—J. S. Dennis, Assistant to the President C.P.R., Calgary, Alberta.

Second Vice-President—W. H. Fairfield, Superintendent Dominion Experimental Farm, Lethbridge, Alberta.

EXECUTIVE COMMITTEE.

C. W. Dickson, vice I. W. Woolsey resigned, Kelowna, B.C.

E. Foley-Bennett, Penticton, B.C.

J. C. Dufresne, Penticton, B.C.

F. J. Fulton, Kamloops, B.C.

Wm. Pearce, Calgary, Alberta.

F. H. Peters, Calgary, Alberta.

D. W. Hays, Medicine Hat, Alberta.

W. X. Wright, Battle Creek, Saskatchewan.

Permanent Secretary—Norman S. Rankin, Calgary, Alberta.

LOCAL BOARD OF CONTROL.

Chairman—R. S. Conklin, Reeve of Penticton.

Secretary—Edgar W. Dynes, Secretary Penticton Board of Trade.

Treasurer—J. H. McCoy, Manager Bank of Hamilton.

Official Reporter—H. J. Russell.

PROMPTNESS.

The essence of success in all meetings, excursions and lectures is *promptness*, and as the time is limited it is the desire of the executives that every delegate make the best of it.

RULES.

Rules governing the conduct of the convention will be read by the secretary from the constitution prior to the opening address. Strict compliance with these will expedite business.

SPEAKERS.

Frank Adams, in charge of Irrigation Investigations, University of California—"An Illustrated Talk on the Orchards Irrigation Methods of California."

Dr. J. G. Rutherford, Supt. Agriculture and Animal Industry Branch, C.P.R.—"Interdependence of Farm and City."

Don. H. Bark, in charge of Investigations, Boise, Idaho—"The Actual Problem that Confronts the Irrigator."

Prof. W. J. Elliott, Principal Provincial Agricultural Schools, Olds, Alberta—"Educating the Farmer's Boy and Girl."

J. W. Eastham, Provincial Pathologist, British Columbia Government —"Moisture Conditions in Relation to Plant Diseases."

C. L. Smith, Agriculturist, O. W. R. & N. Railroad, Portland—"Live Stock and Mixed Farming."

Wm. Young, Comptroller of Water Rights, British Columbia Government —"Water Administration in British Columbia."

H. C. McMullen, late General Live Stock Agent, C.P.R.—"Live Stock on an Irrigated Farm."

Arthur Hooker, Secretary, International Irrigation Congress, Calgary—"The Work of the International Congress."

G. N. Houston, Department of the Interior, Irrigation Branch, Calgary—"The Storage of Water for Irrigation."

C. E. Whistler, Managing Editor, Fruit and Produce Distributor, Portland —"The Care and Culture of Apples and Other Fruits." (Cultivation, insect pests, smudging, harvesting, packing, shipping, etc.)

H. W. Grunsky, Water Rights Branch, British Columbia Government—"Features of the British Columbia Water Act."

Major Richard W. Young, President International Irrigation Congress.

Dr. Frank T. Shutt, Dominion Chemist, Central Experimental Farm, Ottawa, Ont.

S. G. Porter, Dept. of the Interior, Calgary, Alberta—"The Practical Operation of Irrigation Works."

NOTES.

CONVENTION HEADQUARTERS.

Meetings will be held in Steward's Hall, Main Street, midway between the Bank of Montreal and the Bank of Commerce.

SECRETARY'S OFFICE.

The permanent secretary's headquarters are in the Board Room, Incola hotel

REGISTRATION.

Delegates are requested to register with the permanent secretary or his assistant on arrival and at Steward's Hall during convention hours.

RAILWAY CERTIFICATES.

Holders of standard railway certificates will present them to the secretary or his assistant at his office in the Incola hotel or at Steward's Hall during convention hours.

BADGES.

The secretary will issue a badge to each delegate upon registering, and it should be worn conspicuously during the convention to enable the chairman to recognize properly accredited delegates. An additional badge of a distinguishing colour will also be worn by each executive.

ADMISSION.

There will be no charge for admission to any session of the convention and the public are cordially invited to attend. Fruit growers and farmers are especially invited to all sessions and to participate in the discussions.

PRIVILEGES.

Upon registration a special invitation will be extended to all delegates to accept the privileges of the Aquatic Club of Penticton during their stay. The club have a fine club-house on the lake shore, and every delegate is requested to make use of the privilege offered.

OFFICIAL PROGRAMME.

MONDAY, AUGUST 17.

8.30 a.m.—Music by the Penticton Brass Band. Band will play first in front of Incola hotel, later, marching up street, and playing in front of the Convention Hall.

9.20—Music by Emmerton's orchestra.

OPENING SESSION 9.30 a.m.

9.30—The delegates will assemble in Steward's Hall for the opening session The delegates will rise, and led by the orchestra, will join in singing "God Save the King."

The Honourable W. R. Ross, President of the Association, will call the meeting to order, and declare the Eight Annual Convention formally opened.

Invocation—Rev. J. A. Cleland, pastor of St. Saviour's Anglican Church.

9.45—Welcome to the province: Hon. Richard McBride, Premier British Columbia, or representative.

10.00—Address of Welcome: His Worship Reeve Conklin.

10.15—Address of Welcome: E. Foley-Bennett, President Board of Trade.

10.30—President's Report: Hon. W. R. Ross, Minister of Lands.

10.45—Secretary's Report: Norman S. Rankin.

11.00—Music. Emmerton's orchestra.

11.05—Address: E. F. Drake, Supt. of Irrigation, Dominion Government, Ottawa.

11.20—Hon. Geo. Harcourt, Deputy Minister of Agriculture, Alberta.

11.45—Address: Hon. Price Ellison, Minister of Finance and Agriculture.

12.00—Address: Dr. Frank T. Shutt, Dominion Chemist, Central Experimental Farm, Ottawa.

12.15—Appointment committee on credentials and resolutions.

Adjournment.

Afternoon Session.

2.00 — Address: S. G. Porter, Department. Interior, Calgary, Alberta.—"The Practical Operation of Irrigation Works."

2.40—Discussion.

3.00—Prof. W. J. Elliott, Principal Provincial Agricultural School, Olds, Alberta.—"Educating the Farmer's Boy and Girl." Discussion.

3.45—Don. H. Bark, in charge of Investigations, Boise, Idaho.—"The actual problem that Confronts the Irrigator." Discussion.

Evening.

8.00—Dr. J. G. Rutherford, Superintendent Agriculture and Animal Husbandry, C.P.R.—"Interdependence of Farm and City." Discussion.

9.00—Frank Adams, in charge Irrigation Investigations, University of California. —"An Illustrated Talk on the Orchard Irrigation Methods of California."

TUESDAY, AUGUST 18.

Morning Session.

9.30—J. W. Eastham, Provincial Pathologist, British Columbia Government.— "Moisture Conditions in Relation to Plant Diseases." Discussion.

10.15—C. L. Smith, Agriculturist, O.W.R. & N. Railroad, Portland, Oregon.— "Live Stock and Mixed Farming." Discussion.

11.00—William Young, Comptroller of Water Rights, British Columbia Government.—"Water Administration in British Columbia." Discussion.

12.00—Report of the committee on credentials. Report of the committee on resolutions (preliminary).

Afternoon.

There will be no session in the afternoon on account of the regatta of the Penticton Aquatic Club. The regatta is being specially held on this date for the entertainment of the delegates. Penticton Brass Band will be in attendance. Delegates are invited to view the regatta from the club-house and requested to please show their badges.

In the evening the orchestra will be in attendance at the club-house from 9 p.m. Prizes won in the afternoon will be presented to the winners.

Evening Session.

8.00—H. C. McMullen, late General Live Stock Agent, C.P.R., Alberta.—"Live Stock on an Irrigated Farm."

8.45—Arthur Hooker, Secretary International Irrigation Congress, Calgary.—"The Work of the International Congress."

9.00—G. N. Houston, Department Interior, Irrigation Branch, Calgary.—"The Storage of Water for Irrigation."

WEDNESDAY, AUGUST 19.

8.00 a.m.—Through the kindness and courtesy of the Kettle Valley Railway Company, Mr. James J. Warren, President, an excursion train will leave Penticton station at 8 a.m. sharp, and will make the 20 mile run to the Big Tunnel on the east side, and return, arriving back at Penticton at 10.45 a.m. Every delegate is urged to be on hand to catch this train as it must leave on time, in order not to interfere with the programme for the day.

Leaving the station we proceed through the town of Penticton, reaching the main line of the Kettle Valley about 1 mile from the station. To the right may be noticed the Penticton recreation grounds, the grand stand and the horticultural buildings. On these grounds the Penticton Turf Club have developed one of the best race tracks in the Okanagan Valley.

Soon after reaching the main line, we pass the new municipal power-house on the right, where the Mirrless oil engine supplies the power for the town's electric plant, and is working very satisfactorily. After crossing Penticton creek the railway skirts the bench residential section, where some fine residences have been erected. After crossing Vancouver avenue, and leaving the town well behind, we notice the Kettle Valley farm on the right, where a fine herd of thoroughbred Holsteins are to be seen. From this point the railway skirts along the steep clay cliffs which rise above the lake, and about 3 miles out the railway swings in toward the mountain, crossing through some of Penticton's finest orchards, although the largest area of compact orchards will be seen on the motor drive in the afternoon. Here and there will be noticed iron pipes passing in under the railway track. This is a part of the Penticton municipal irrigation system.

As we pass along the railway creeps higher and higher up, the gradual rise in the grade reminding one somewhat of the climb from Robson to Shields on the Columbia and Western, with this difference, that instead of the lake mountain sid you view a panorama of lake, towns, mountains, orchards, and homes. When we cross Mill creek about 9 miles from Penticton, below us lies the picturesque little town of Naramata. Across the lake are the towns of Summerland and West Summerland.

Leaving Mill creek behind we come to the loop. Enclosed in the curve of the loop is a beautiful natural park owned by the railway, which they propose

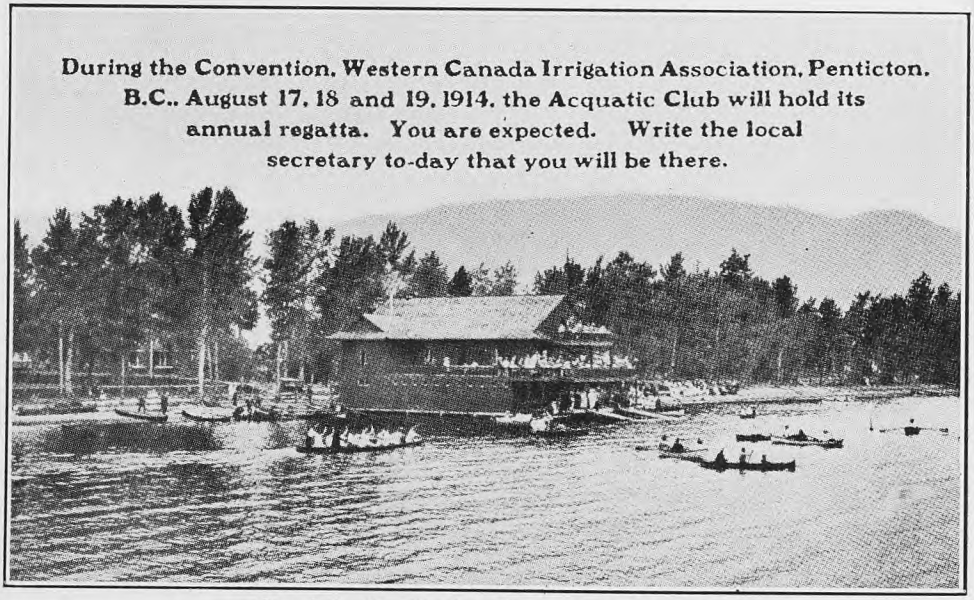

Mr Arthur Hooker, Secretary
International Irrigation Congress
Mr Norman S. Rankin,
Permanent Secretary, W.C.I.A.
Mr W.H. Fairfield,
Superintendent Dominion
Experimental Farm,
Lethbridge, Alta
Vice President W.C.I.A.
Mr Wm. Pearce, Calgary, Alta
Chairman Executive Committee, W.C.I.A
Mr D. W. Hays, Medicine Hat, Alta,
Member Executive W.C.I.A.

to reserve for that purpose. It is likely to be a popular resort for picnic parties. After passing around the loop we climb the last grade before reaching the Big Tunnel, where the stop is made. A few hundred feet above we see the track again, this portion being on the other side of the tunnel. To our right as we near the tunnel may be seen the telephone line of the Forest Service, which is doing such good work under the supervision of the Minister of Lands, Hon. W. R. Ross. This line is used to give the alarm in case of a forest fire. We understand that arrangements are being made to have a telephone line run along the whole summit between the Kettle Valley and the Okanagan.

The tunnel, where we stop, is upwards of 1,650 feet long and is the longest tunnel on the Kettle Valley line. Returning, we obtain a splendid view of the town of Penticton, and on a clear day Skaha lake and the fruit lands of Kaleden may be seen very clearly. On each side the mountains rise to an altitude of upwards of three thousand feet, while the summits farther back are much higher. The whole scene suggests a vast natural amphitheatre with a swimming pond in the pit.

On the return trip the train is scheduled to arrive at Penticton station at 10.45. am.

11.00 a.m.—A run is now to be made to West Summerland.



One of the Post Cards used to advertise the Convention.

We proceed by the same route as before to the main line, and then westward through the Indian reserve. At this point the delegates are invited to casually consider the obstacle to the development of the district which is being encountered through the fact that a small band of Indians own a very large tract of splendid land, much of which they never use except for grazing, and which, if water were

applied, would rival the best fruit districts of the Okanagan. Exact figures are not to hand, but we understand that less than two hundred adult Indians are in possession of almost fifty thousand acres of land, about a quarter of which is good fruit land.

Just before we reach Trout creek we pass the point selected for the proposed Dominion Government Experimental Station.

We now cross the Trout creek bridge, upwards of two hundred and fifty feet high, and one of the most expensive railway bridges in the province. After crossing the bridge we come into the municipality of Summerland. About a mile farther on is the site of the Summerland station, the buildings not being commenced as yet.

At this point the delegates will be met by representatives of the Summerland Board of Trade and other prominent citizens and fruit growers of the district. After sampling the fruits raised in the district, the train will proceed to Prairie Valley reservoir, in which a portion of the water used for the municipality is stored. On the way a short stop will be made at a point on the line from which an excellent bird's eye view of about 2,500 acres of orchards in all stages of development is obtained. The majority of these orchards have just sufficient slope to allow that perfect irrigation which is one of the chief factors in raising that delicious fruit which is bringing the Okanagan valley more fame every year.

From this point on to the reservoir, many of the orchards already seen will be passed. Most of them are dotted with comfortable, and in some cases, luxurious homes.

As there is not time for further travel in a westerly direction there will be no opportunity to see the many acres of virgin soil, which needs but little clearing to make it ready for cultivation, and which lies to the west of the reservoir, and practically at the same elevation.

It was the wish of the Summerland Board of Trade that they might be permitted to drive the delegates through some of the orchards, but the committee found that the time available would not permit of this.

Afternoon Session.

2.00—Address, C. E. Whistler, Managing Editor—"Fruit and Produce Distributor," Portland, Oregon.

"The care and Culture of Apples and other Fruits". (Cultivation, insect pests, smudging, harvesting, packing, shipping, etc.)
Open discussion.

3.30—H. W. Grunsky, Water Rights Branch, British Columbia Government,—"Features of the British Columbia Water Act."

4.00—Final report of Committee on Resolutions.
Election of officers and selection of place of meeting for next convention.

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Delegates arriving at Penticton, B.C., August, 1914

4.45—Motor trip to orchards and down to Skaha lake.

The automobiles will line up on Main street in front of the Convention Hall, and the route taken will be as follows:

Up Main street to Eckhardt avenue, and thence out to the bench. On this run we pass some of the oldest and finest orchards in the Penticton district. A prominent horticulturist has stated that in this portion there lies the finest area of absolutely compact orchard in British Columbia. After turning to the north at the corner of lot thirty-six we pass on the right the orchard recently purchased by Mr. McNicoll, vice-president of the C.P.R., and upon which he is erecting a beautiful home. Further on we pass the orchard and summer home of Mr. J. H. Munson, of Winnipeg, who owns one of the show places of the district. Far to our right at the foot of the mountain lies the main ditch of the Penticton creek irrigation system.

Turning to the left at lot nineteen we take a cross-road which brings us back to the road running to the town along the lake shore. On this cross-road we get a splendid view of Okanagan lake, and the towns of Summerland, West Summerland, and Naramata may be seen in the distance.

Once more reaching Penticton we go up Front street to Main street, passing the plant of Western Canners, Ltd., on our right. It may be of some interest to delegates to know that Front street is part of an old railway grade made by McKenzie and Mann more than twenty years ago, when they proposed to run a railway from Penticton to Midway. It was completed to Skaha lake, when for some reason work was stopped. We again go up Main street through the business section, pass the Convention hall, and follow the same route as before to Eckhardt avenue, when we proceed south, passing the new public school on our left, and the high school on our right. The public school has eight rooms, library and assembly hall, and is fitted up with all modern appliances. It is surrounded by a playground of 4 acres, constituting one of the finest school properties in the interior of the province. We now go directly to lake Skaha, and return by way of West Main street and Main street to Huth avenue. Thence to Fairview road, Hastings street, and down to Moosejaw street, where a short stop will be made at the shops and yards of the Kettle Valley Railway. Through an agreement signed with the Kettle Valley Railway, Penticton is to be made a divisional point.

Thence up Moosejaw street, along Eckhardt avenue to Winnipeg street, down Winnipeg street to Fairview avenue, and along Fairview avenue to Main street, and back to the business section.

Evening.

A banquet will be tendered to the speakers, foreign delegates and visitors by the Municipal Council and the Board of Trade. Reception 8.15. Banquet at 8.45 in the Incola hotel.

CONVENTION RULES.

Each morning session shall be called to order at 9.30 a.m., each afternoon session at 2 p.m., and each evening session at 8 p.m. Morning sessions shall adjourn at 12.30 p.m., unless otherwise ordered by vote of the Convention.

All sessions shall open promptly.

Any delegate or other member desiring to speak shall address the Chair, and unless called on by name shall begin by giving his name and place. Communications on subjects not entered in the programme will be limited to five minutes, unless otherwise directed by vote of the convention.

General resolutions, after reading, shall be referred to the Committee on Resolutions, without debate, and no general resolution shall be received after the opening of the convention, without unanimous consent. Special resolutions relating to the conduct of the association may be read and considered at the discretion of the presiding officer after examination by him.

The time of speakers in general discussion shall be limited to ten minutes, and the time of speakers on questions or resolutions relating to the conduct of the convention shall be limited to five minutes, unless otherwise directed by vote of the convention.

For the convenience of the convention and speakers a bell will ring once three minutes before the close and twice at the close of the time allotted to each speaker on the programme. In the course of discussion and in addresses not entered on the programme, the bell will ring once one minute before the close and twice at the close of the time allotted to the speaker under these rules.

Any speaker rising to address the convention, who is in the employ, whether by retainer or otherwise, of any public service corporation which is interested in the action or subjects of deliberation of this convention, shall mention the fact and nature of such employment before proceeding to speak.

THE WESTERN CANADA IRRIGATION ASSOCIATION.

OFFICERS FOR THE YEAR 1914-15.

Hon. President—The Honourable W. J. ROCHE, Minister of the Interior.

President—The Honourable DUNCAN MARSHALL, Minister of Agriculture for the Province of Alberta.

Vice President—DR. C. W. DICKSON, Kelowna, B.C.

Second Vice-President and Chairman Executive Committee—WILLIAM PEARCE, Calgary, Alberta.

Executive—

R. C. PEGLER, Bassano, Alberta.

F. H. PETERS, Calgary, Alberta.

W. HUCKVALE, Medicine Hat, Alberta.

W. H. FAIRFIELD, Lethbridge, Alberta.

JAMES JOHNSTON, Nelson, B.C.

WILLIAM YOUNG, Victoria, B.C.

ARTHUR CHAMBERLAIN, Kamloops, B.C.

J. C. DUFRESNE, Penticton, B.C.

Permanent Secretary—NORMAN S. RANKIN, Calgary, Altbera.

Next place of meeting—Bassano, Alberta.

Report of the Proceedings

Of the

Eighth Annual Convention

Of the

Western Canada Irrigation Association

Held at Penticton

On

August 17, 18 and 19, 1914

OPENING SESSION — Monday, August 17 — 9.30 a.m.

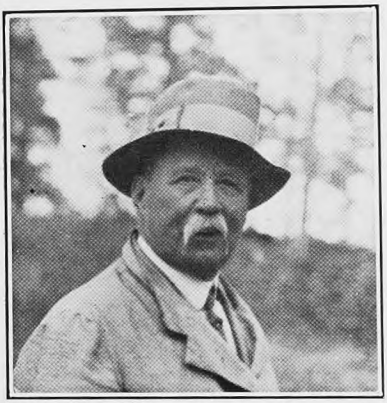
The eighth annual convention of the Western Canada Irrigation Association opened in Penticton, B.C., on Monday, August 17, at 9.30 a.m.

In the unavoidable absence of the President and Vice-President, the chair was taken by the Second Vice-President, Mr. W. H. Fairfield, Superintendent of the Dominion Experimental Farm, Lethbridge, Alberta.

In calling the convention to order, the chairman said: "Ladies and gentlemen, in the absence of our president, the Honourable Mr. Ross, it is my pleasant duty to declare this, the Eighth Annual Convention of the Western Canada Irrigation Association, formally open, and we will ask all to rise and join in singing, God Save the King." At the conclusion of the national anthem the chairman said: "Our programme will be prefaced by an invocation by the Rev. J. A. Cleland, Rector of St. Saviour's Anglican Church." The Rector then led the Convention in prayer.

CHAIRMAN: We are now to hear an address of welcome to the Province of British Columbia by the Hon. Price Ellison, Minister of Finance and Agriculture. It is unnecessary for me to offer anything in the way of introduction for this gentleman to a British Columbia audience, but for the benefit of delegates from the eastern sister provinces, I might say that the Hon. Price Ellison has been one of the best friends of agriculture, not only in the province, but particularly in this valley. He has been an indefatigable worker in the interests

of irrigation and, as you know, is an old timer. He has been an earnest supporter of the Western Canada Irrigation Association ever since its inaugaration. (Applause.)



Honourable Price Ellison, Minister of Finance and Agriculture, B.C. (Snapped at Pentiction).

Hon. PRICE ELLISON: Mr. President, ladies and gentlemen,—You will pardon me if I am not able to make myself heard, but I have have been suffering from a severe cold. I am delighted to be here this morning with you, and to welcome you, and tell you how much Sir Richard McBride regrets that he is not able to be with you to-day. It is very fitting indeed that he should be where he is, because if there are any submarines to be offered for sale or anything else to go to strengthen the Army or the Navy of the nation we are so proud of, he will be there to to do it. (Hear, hear.) As a member of the Cabinet, I welcome you to British Columbia, and as the representative of this district, and this particular portion of it, Penticton, I welcome you, because I know the people of Penticton do this heartily and cordially in a manner and will do before you are through—that I am unable to express, I am sure.

I wish to thank Mr. Rankin for this splendid programme, and if it is carried out you will have a splendid time I am sure. We have with us the most eminent men on irrigation, water, water rights, and the use of water, and we are truly thankful that we should have such a lovely day and, by the way, how appropriate it is that we should have had such a splendid shower of rain last night. We have scarcely had one since Easter time. Some of the grain sown in April has not even germinated. Can you imagine such a thing? I say, whose fault is it that not a drop can be put on the land? Some of the people in this district have spent hundreds of thousands of dollars—public companies, corporations, and municipalities—and they have all run up against the real thing, gentlemen. They have not got enough money to complete their systems. Now, this is a vital thing—vital in this section of the country. Then, when you stop to think of the large amount of money spent—and, by the way, I have heard it more than once said "Why, these irrigation conventions are C.P.R. propositions." Well, all I can say is that they have done a big thing if they never did anything else, gentlemen, than to put water on the land and make it productive. (Applause.) And when you stop to think of the fact that they have spent millions of dollars, they are good people to follow, gentlemen. But, it is only those who are timid that grumble the most.

Now, it is not time to make a speech with reference to what we ought to have right here and in other districts. I have told you that the people are not able to do it. The Government of British Columbia have organized a Water Branch, and they have secured the services of the most expert men obtainable, and yet those men have not found out a way to give us water, gentlemen. It

is no use making rules and regulations if you have not got the water. The first speech I ever made in the legislature was with reference to irrigation. The Government of the day had been spending hundreds and thousands of dollars in reclaiming land by dikes, and I said "What difference is there whether you put water on the land or take it off in order to make it productive? The results are the same." But the Government had been willing to let other people do that, and now the time has come and, unfortunately too late, when the desirability of a better condition is evident. But the people, had they acted at the time, would have secured the Government ownership of irrigation and it would have been in operation to-day in the southern part and interior of the province of British Columbia. Now, so many millions have been spent in irrigation projects that it is difficult to take them up.

Our experts will tell you that legislation has been framed whereby you can organize associations. It is too late. How can small municipalities under the Act, or any body of men, get sufficient money together at a reasonable rate of interest ? The interest is everything in reference to irrigation, when you think of the large amount of land lying idle, and what is it worth ? Not much without water. I don't include the whole of this district, because there are exceptions in some sections. They don't need irrigation. But, if most of the places had got some water this year it would have doubled the crop. It grieves me when I have to think of it. Some will say "Why, you ought to be satisfied. You have grown a good crop." Just imagine, gentlemen, it is a critical time when competition is so keen with our neighbours who have irrigation enabling them to produce so much more to the acre. Now, if you can take another crop, it means the profits. That is something, and why should a man be told not to grow another crop. One of my neighbours in the city of Vernon has grown two crops of alfalfa, and there is a third coming. And if the water is not obtainable, who are we to look to ? Are we to look to the Government ? to the C.P.R ? The Federal Government of the United States have spent millions of dollars in irrigation. Surely, when we stop to think of the land we have and remember that it is a paying proposition, and when we think of the amount of agricultural products imported into British Columbia, it is a reflection on the people. Now, I want to say that the Government belongs to you, the Government you make, and whatever you ask for and stay with it, you will get. But don't be lukewarm. You cannot get it by just asking and sitting down. The project is large and means much money, but something must be done.

Last year we imported over twenty million dollars worth of food-stuff. Just imagine that amount in the pockets of the people of British Columbia, and see what it means. Figure the interest of that alone, and consider that we have been doing it for some time. Is there any other way that you could make the land productive than by putting water on it ? None whatever, and a young province, with natural resources, ought not to be afraid to undertake it. The people are very much worked up in the southern end of this district, and even those who had water have had a very limited amount.

Now, I do not intend to talk to you at length. I know that the people of Penticton are more than pleased with the turnout, considering everything, and to see so many who are deeply interested in irrigation. You are not here from

idle curiosity. You are here to tell the people what you know. That is what conventions are for, and I am sure that we shall all benefit by the able addresses that we are to hear.

Ladies and gentlemen, I thank you very much indeed, and again on behalf of the province of British Columbia and the people of this district, I welcome you indeed and hope that you will have a splendid time. (Applause.)

CHAIRMAN.—Next we shall have an address of welcome by His Worship Reeve Conklin. I may say that he is not only reeve of the town, but is also chairman of the local Board of Control. The local board is the board that has worked so continuously and indefatigably in every way that would aid in making this convention a success, and they have also done everything in their power to aid in the comfort and the convenience of the visiting delegates. I might mention just one little instance that will illustrate how careful they have been. Last night, a member of the local reception committee who went down to the dock as the boat came in, happened to hear, inadvertently, a remark to the effect that the dust was so deep. You know the result. Before morning this trouble had been removed. (Laughter.)

His Worship REEVE CONKLIN.—Mr. President, ladies and gentlemen, it indeed gives me very great pleasure to offer you Penticton's welcome, for I am sure by the looks of most of the faces I see around me that you are going to get the treatment you are entitled to. I was very pleased to listen to my honourable friend, the Hon. Mr. Ellison, our member. It is not very often we have the pleasure of listening to him. We people here sometimes find it a little burdensome to pay the rates that have to be imposed for the privilege of using water, and while he did not say so directly—still we can read between the lines—I gather from what the honourable gentleman said today that he is coming to our relief by the Government assisting us. Well, that is very glad news, more particularly as one of our delegations has returned from Victoria where it was sent to ask for government assistance and I think their chief difficulty was that when they got there, but few members of the Government were on hand to receive them.

As the honourable gentleman said, the Government is our own, but still our Government does not always do as we would like, more particularly along the said lines, but when we have the word of the Hon. the Minister of Finance, I think after this we may feel perfectly satisfied that we are going to be properly attended to.

I thank you Mr. President, for the kind words you said in connection with the efforts made by the Board of Control and, ladies and gentlemen, I would just like to draw your attention (indicating) to our Board of Control—not including the Hon. Mr. Ellison, although we would be very glad to have him—but you can see that I, as chairman of the Board of Control, have had a pretty strong backing in getting up this entertainment which we hope to put before you. We have on our Board of Control, all the members of our Municipal Council, and most of the Board of Trade, and we have all worked with one object —to put up a proper entertainment for the ladies and gentlemen expected here, and we are very glad to see as many, particularly the ladies.

I might say that we are probably a little disappointed in the number and regret the reason, but, as the Hon. Mr. Ellison pointed out, the war no doubt has been the main cause of there not being a larger representation than at present. However, I feel quite sure from conversations I have had with some and by the appearance of the others, that if we lack in numbers, we more than make up in enthusiasm. (Applause.)

It may not be out of place for me to mention a few of the entertainments in which we wish to have you participate. First, we are indebted to the president of the Kettle Valley Railway, J. J. Warren, Esq., for his assistance. We are looking anxiously forward to the completion of this railway, and Mr. Warren has placed at our disposal, and invites the delegates and their ladies and most of the committees and citizens, up to the number of 250, to participate in an excursion out to the Big Tunnel, for which occasion he has provided special observation cars. (Applause.) After viewing the beautiful scenery of the points to the east, you will have the privilege of going on the same road to the west, where you will be the guest of our sister town, West Summerland. After the return of that excursion, I believe there is to be a session of this convention, after which you are very heartily invited to an automobile ride in cars provided by the citizens. We are indebted to the president of the Aquatic Club—I was going to say of the Bank of Montreal, but I am anticipating a little (laughter)—we are indebted to the courtesy of Mr. J. H. McCoy, president of the Aquatic Club, and you are invited to an aquatic event to-morrow afternoon, to which you have free access and all privileges of members; in fact, I believe we have greater privileges, for the members have to pay their admission, while we have the full privilege of going in D.H. (Laughter.) In the evening, I believe they intend to have a dance. I may be a little mistaken, but we have a fad for dances, whether it is summer or winter, and we are always open to a shaking of the light fantastic. (Laughter.) I am also informed that the prizes won in the regatta are to be presented on that particular occasion to-morrow evening. To the ladies accompanying the delegates, we are very pleased to say that the ladies of our town have formed a committee at the request of the Board of Control, and I am quite sure they will see that you have every attention and entertainment and I might say that if any members or delegates wish to go out and have a good time, they may be sure their ladies will be properly attended to in their absence. (Laughter.) I have heard it remarked that when a gentleman goes away from home accompanied by a lady, he is sometimes glad to be relieved of her. (Laughter.)

Now, I think, ladies and gentlemen, I have mentioned all the principal events that are scheduled to take place during your short stay here, and I am only sorry it is not a little longer. I feel sure you will be of the same mind as you view and taste this fruit, and we desire you to help yourselves. You are welcome to all you can properly get away with. (Laughter.)

Now, Mr. President, ladies and gentlemen, I again bid you welcome to the town of Penticton and we look to see everyone properly at home, and if there is anything you want and don't see, simply ask for it and any member of our board will gratify you. Thank you. (Applause.)

CHAIRMAN: We are now to have another address of welcome from Mr. E. Foley-Bennett, President of the Board of Trade. I am only sorry there are not two or three more.

MR. E. FOLEY-BENNETT.—Mr. President, ladies and gentlemen, it affords me the greatest pleasure indeed to join His Worship the Reeve in extending to you a most hearty welcome to Penticton. Two years ago, our Board of Trade decided to make every effort in securing for Penticton this convention which has to-day opened in session, as we fully realized the inestimable benefit to be derived from the most valuable instruction on irrigation which it is the object of this association to impart. This vast territory throughout the dry belt of British Columbia is depending practically entirely on irrigation for the production of the great wealth in its rich soils. Portions of this territory, hitherto lying idle, have given wonderful results under irrigation and, in consequence, every farmer is most anxious to obtain all the instruction possible.

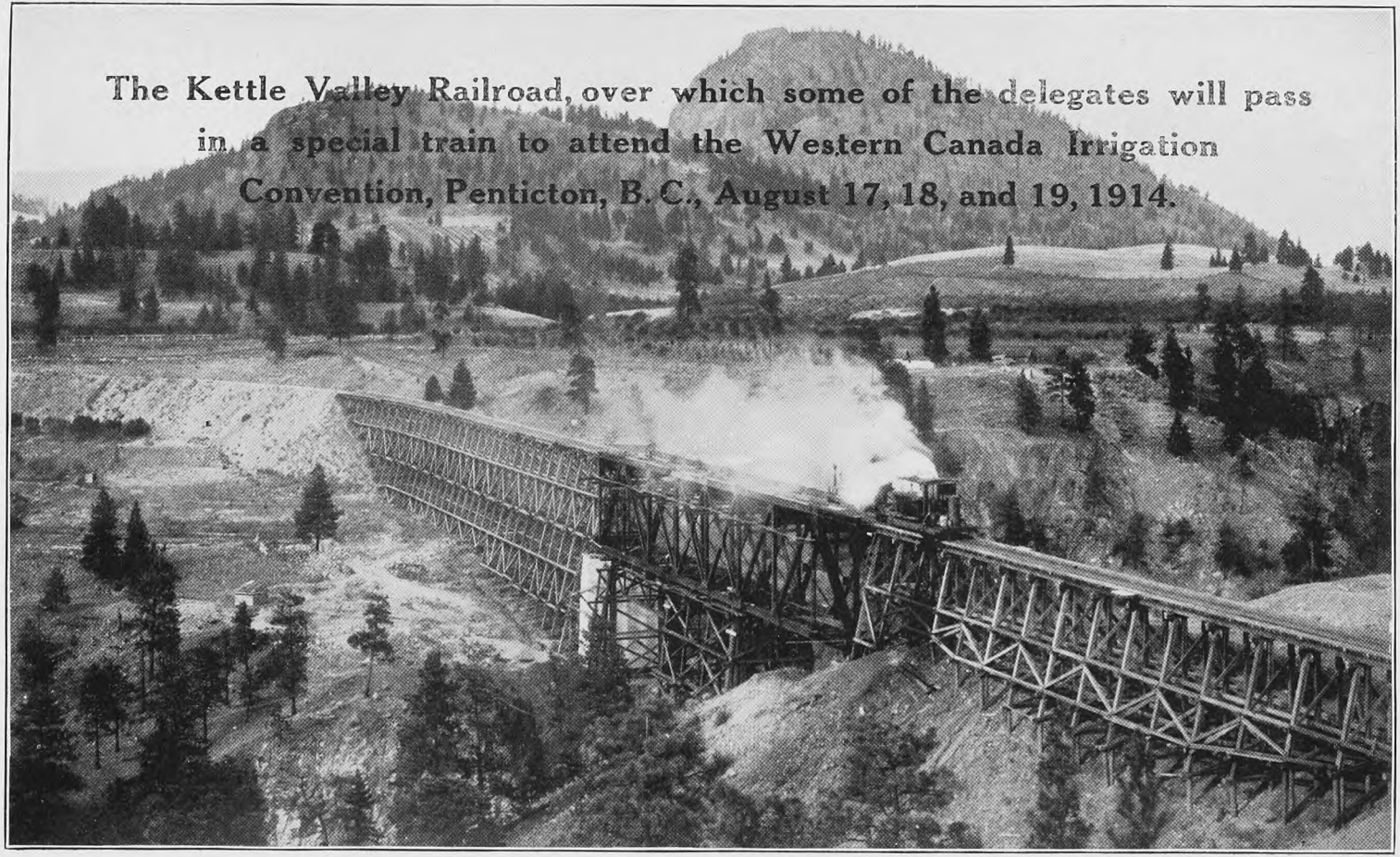
In view of these facts, we do most heartily welcome to Penticton this distinguished gathering, many of whom have come long distances in order to give us that instruction which means the success of every commercial enterprise throughout the dry belt of British Columbia.

Mr. President, a short time ago the question arose as to whether it was not advisable to postpone this convention in view of the fact that Great Britain was at war, many thinking that this would have a depressing influence. We cannot deny the fact that this is a most anxious time throughout the Empire but, Mr. President, I am sure you will agree with me that no matter what our situation may be, our business obligations must be attended to, and the channels of commerce kept open. This war will bring sorrow to many homes; all wars do, but we can bear our sorrows like Britons, and bravely fulfilling our duties at home and on the field of battle, remain strong in the conviction that our flag will emerge victorious and Great Britain ever retain her impregnable position as arbiter of the world's peace. (Applause.)

This convention will furnish us with most valuable instruction on modern lines, dealing with the best methods of irrigation. To collect together all this instruction has incurred a vast amount of work and much expense, and I sincerely trust that nothing will arise that will interfere with the successful carrying out of this most valuable educational programme provided for us.

Mr. President, ladies and gentlemen, in again welcoming you to Penticton, though we cannot present to you a Calgary or a Vancouver, yet still we can and do extend to you a true western welcome, and it is the determination of every resident in this district to make your visit so pleasant that you will all be looking forward to the time when we will again have the honour to welcome to Penticton the Western Canada Irrigation Association, (Applause.)

CHAIRMAN: The next on the programme is the president's address, by the Hon. W. R. Ross, Minister of Lands. In the absence of our honourable president, this item will have to be omitted. In passing, however, I might say that this is the eighth convention; in other words, the association has been in existence eight years, meeting alternately in Alberta and British Columbia. However, as the name indicates, it is not merely confined to the two provinces of Alberta



One of the Post Cards used to advertise the Convention.

and British Columbia, but covers certain territory in Saskatchewan where irrigation water has been used; and although it has always gone to Alberta when the convention has been held east of the Rocky mountains, I am afraid that if our friends from Bassano do not put in some strenuous work, the convention may go to Saskatchewan, and you delegates from British Colombia will have a longer trip to take. (Laughter.)

Each year, the work of the convention has grown, and this year we are going to have, I believe, one of the best conventions we have ever had. Unfortunately the delegates are not quite so numerous as we would like to see, for various reasons; still, we are going to have a number of treats in addresses and discussions. We are going to have with us, as no doubt you have noticed, Professor Frank Adams, in charge of irrigation investigations, University of California; Don H. Bark, in charge of investigations, Boise, Idaho; Joseph T. Hinkle, of alfalfa fame; Mr. C. L. Smith, Agriculturist with the O. W. R. & N. railroad, of Portland; and Mr. Arthur Hooker, secretary of the International Irrigation Congress, which meets this fall in Calgary, for the first time in Canada. So that we have, not to mention any of our local speakers, some men from the outside who are going to give us something worth listening to.

Now, not to take up any more of your time, we will ask for the secretary's report, by our permanent secretary, Mr. Norman S. Rankin.

Mr. Rankin: Mr. President, ladies and gentlemen, do not be alarmed because you see me here with this voluminous report in my hands. Since our Seventh Annual Convention, held last summer at Lethbridge, Alberta, several matters of interest to this association have taken place, and though my report when printed will deal with them comprehensively, I will only take sufficient time this morning to speak of those of greatest importance.

Briefly, these matters are as follows:—

(1) Resolutions pertaining to business of the association taken up and brought to issue with the Dominion and Provincial Governments.

(2) Securing for Canada the first Canadian meeting of the International Irrigation Congress.

(3) Assistance rendered to the Cypress Hills Water Users' Association in organizing and conducting their First Annual Convention.

(4) Active part taken in the Oregon Irrigation Congress held at Portland, Oregon, in February, which has resulted in their co-operation in supplying speakers and delegation to this convention to-day.

(5) Revision of membership and representation to our conventions, and adoption of official certificate of appointment.

(6) Appointment of committee representing various irrigation districts in British Columbia which investigated the "Public Irrigation Corporation Bill" and reported back to the Government.

(7) The issue of 2,500 reports to delegates, public libraries and special solicitors. The issue through our mailing list of 1,200 alfalfa bulletins secured from the Dominion Government through Vice-President W. H. Fairfield.

(8) Publication of considerable publicity regarding irrigation in Western Canada, of which books of clippings are open to inspection of delegates.

RESOLUTIONS.

As set forth above, resolutions arising out of the Lethbridge convention, have been taken up and followed through to successful action. These resolutions are set forth in the annual reports (pages 155, 183, and 184) spread around the seats in the hall, but for the convenience of the gathering, I will briefly quote the most important of them:—

Affiliating the Cypress Hills Water Users' Association with the Western Canada Irrigation Association.

Appointment of delegates to attend the 5th Oregon Irrigation Congress at Portland, Oregon.

Dominion and Provincial Governments urged to establish demonstration farms at such points as will meet requirements of country.

Governments asked to take steps to render communication between water users and administration more easy by the establishment of sub-offices, etc.

Revision of the membership and representation to conventions and adoption of Official Certificate only upon presentation of which holder will be entitled to a delegate's rights.

INTERNATIONAL IRRIGATION CONGRESS.

This congress, through the direct efforts of this association, for the first time in its history, and since its internationalization, has been secured to Canada, and will be held at Calgary, October 5 to 9. You will remember that your delegation to the last meeting of this congress assisted in its internationalization, and at that time, and upon request of the Calgary Industrial Bureau and City Council, extended an invitation to that body to hold its 1914 convention in Canada. Although considerable opposition was demonstrated against this step south of the line, the Board of Governors accepted the invitation of the city of Calgary, stating that "They considered such a step in the best interests of the congress to increase the efficiency of the congress and to develop its international character." Secretary Hooker, with whom your secretary kept in close touch during the past year (there being no Congress in 1913) moved his office over into Canada during the latter part of March, and has everything in readiness for the big meeting in October. Fears were expressed by several delegates that the securing of this congress would deflect attendance from our own convention, but this meeting to-day does not justify that fear, and we number amongst our delegates the permanent secretary of the International Congress. Your secretary, being chairman of the Publicity Committee of the International Irrigation Congress, has been able to make frequent reference to the Eighth Annual Convention of this Association in the publicity matter issued by the International Congress, with benefit to both meetings.

In this connection, it would be unfitting did I not make reference to the generosity of the Dominion Government and the Governments of British Columbia and Alberta in supporting the International Congress with necessary grants. The city of Calgary and the Canadian Pacific Railway also assisted in this way.

FIRST ANNUAL CONVENTION, CYPRESS HILLS WATER USERS' ASSOCIATION.

On January 28, the Cypress Hills Water Users' Association held their first convention at Medicine Hat, and in accordance with the request of their secretary for speakers, your secretary was able to induce Messrs. F. H. Peters, Commissioner of Irrigation, Calgary; S. G. Porter of the Department of the Interior, Calgary; Professor W. J. Elliott, Principal Provincial Agricultural School at Olds; H. C. McMullen, general Live Stock Agent, C. P. R., Calgary;

and R. J. Burley of the Department of Interior, Calgary, to go down and address the gathering. The following is the programme, which was an interesting and educational one:—

The meeting will convene at 1.30 p.m.

1.30—Hon. President, D. J. Wylie, "Opening address."

1.45—Acting Mayor, Charles Pratt, "Address of welcome."

2.00—E. F. Drake, Dominion Superintendent of Irrigation, Ottawa, "Back to the Land." Discussion.

2.30—Walter Huckvale, "The Lethbridge Convention." Discussion.

2.50—F. H. Peters, Commissioner of Irrigation, Calgary, "Practical Hints on Irrigation in the Cypress Hills." Discussion.

3.15—Norman S. Rankin, Permanent Secretary Western Canada Irrigation Association. "Saskatchewan has all the winners."

3.30—S. G. Porter, Irrigation Branch, Department of the Interior, Calgary, "Business Methods Applied to Farming. "Discussion.

3.55—Prof. W. J. Elliott, Principal, Agricultural School, Olds, Alberta, "Educating the Farmer's Boy and Girl." Discussion.

4.20—R. J. Burley, Irrigation Branch, Department of the Interior, Calgary, "The Value of Reservoirs to the Farmer," Discussion.

4.40—H. C. McMullen, General Live Stock Agent, C.P.R., "Live Stock on an Irrigated Farm." Discussion.

Evening session will convene at 7.30 p.m.

7.30—Secretary's Report. Discussion.
Reading the minutes of last meeting.
Other business.
Election of officers for ensuing year.
Adjournment.

Mr. E. F. Drake, Superintendent of Irrigation, showed his interest in the meeting by coming all the way from Ottawa to be present at this Convention, and the meeting was said to be productive of valuable results to the farmers in that district. In order to secure as much publicity as possible for the Convention, the newspapers were supplied with the following article, which I quote from the Medicine Hat *News*:

"The First Annual Convention of the Cypress Hills Water Users' Association opened in the city hall this afternoon at 2 o'clock, with the Honorary President D. J. Wylie, M.L.A., in the chair. He gave a short address, emphasizing the objects of the Association, and the bright prospects ahead of them in their work. Although the organization was only one year old, there were in its ranks the men who would make the irrigation work grow and prosper. He called upon Acting Mayor Pratt to address the meeting. Mr. Pratt regretted that the Mayor was not present to welcome them, but nevertheless took pleasure in extending a hearty welcome to them in behalf of the mayor and city. He was quite cognizant of the importance of the gathering, and was certain that much valuable information would be gained at the meeting which would further the work of irrigation in the province and district.

"E. F. Drake, the Dominion Superintendent of Irrigation at Ottawa, spoke on the subject "Back to the Land" which was of especial interest because of the intimate knowledge of the situation in the West which the speaker manifested, and because of the valuable information that he gave to the delegation present. He stated that although there were 76,000 acres of land included in the various irrigated schemes in the Cypress Hills district, only about 10,000 of this acreage was already developed.

"The pressing need of development of the agricultural resources of the country was explained by statistics showing that the world's production of grain and meat were falling far below the increase in population. 'To bring back the people to the land' was the solution to the great problem, and this object could be best gained by making the farms more attractive or more profitable, which amounted to practically the same thing.

"He discussed the resolutions presented last year by the Association describing the progress of the plans for establishing water reserviors both north and south of the Cypress Hills. The department had not thought it advisable at this time to establish a branch at Maple Creek, because of the undeveloped state of many of the irrigation projects of this section. He also explained the method of gauging the water in the streams and the reasons of the department for so doing.

"R. J. Burley, of the Department of Interior at Calgary, gave an instructive address on "The Value of Reservoirs to the Farmers" explaining how the great waste of water from the flow of the streams from the hills was wasting much water each year.

"He estimated the total loss in one year from the Hills, to be in the neighbourhood of 25,000 acre-feet of water, or approximately enough water to irrigate 25,000 acres. The methods advised by the department included the damming of the streams in the beds in the small lakes and sloughs and in reservoirs constructed near the streams. The success of the projects would probably lie in the development of many small reservoirs at small cost rather than through the erection of large and expensive projects. He stated that the department was deeply interested in the problem and much good work could be expected from them along this line.

"F. H. Peters, Commissioner of Irrigation at Calgary, gave an interesting and instructive address, 'Practical Hints on Irrigation in the Cypress Hills.'

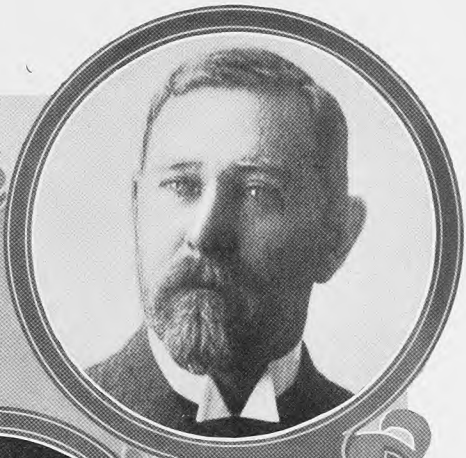
"Following him on the programme was Norman S. Rankin, Secretary of the Western Canada Irrigation Association; S. G. Porter of the Irrigation section of the Department of the Interior, Calgary; Professor W. J. Elliott, Principal of the Provincial Agricultural School at Olds; R. J. Burley of the Irrigation Section of the Department of the Interior, Calgary; and H. C. McMullen, General Live Stock Agent for the C.P.R., Calgary.

"The evening session was devoted to addresses not heard in the afternoon and to routine business. The following officers were elected.—

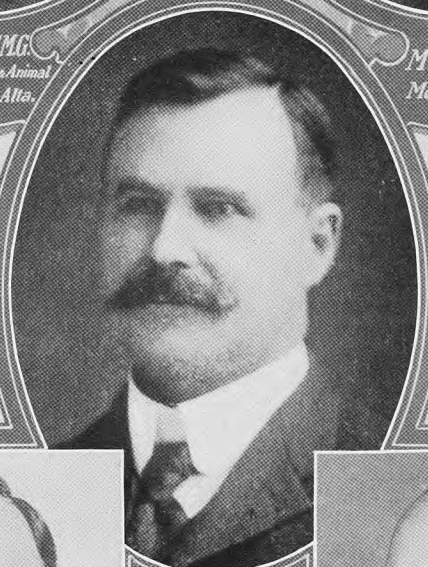
"Honorary Presidents—Hon. W. R. Motherwell and Robert Needham.
President—R. G. Williamson.
1st Vice-President—I. H. Williams.
2nd Vice-President—Thomas Hargrave.
Secretary-Treasurer—G. S. Herringer.
Executives for the eleven districts were chosen as follows.—
1. Joseph Dixon, Maple Creek.
2. C. Stearns, Gull Lake.
3. W. Huckvale, Medicine Hat.
4. W. Barrington, Medicine Hat.
5. D. Drinnan, Walsh.
6. G. Stewart, Maple Creek.
7. S. Unsworth, Piapot.
8. Dan Morrison, South Fork.
9. T. A. Drury, Maple Creek.
10. D. Wood, Coulee.
11. Isaac Stirling, Nashlyn.

"Walter Huckvale was selected to succeed W. X. Wright as representative to the Western Canada Irrigation Association this year, which automatically places him on the executive of that body. It was decided to petition the Saskatchewan Government for a grant to assist the association in its work and the matter of establishing reservoirs for storing surplus water for irrigation, was presented to the Dominion Government."

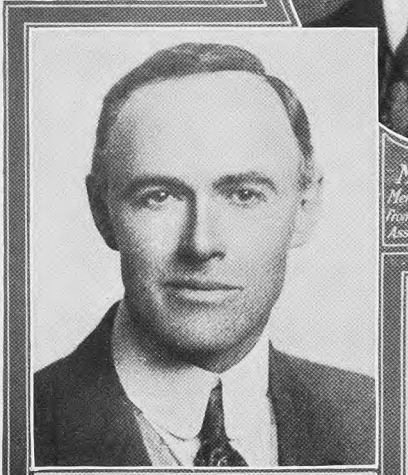
Dr. J. G. Rutherford, C.M.G.
Superintendent of Agriculture & Animal Husbandry, C.P.R. Calgary Alta.



Mr. Walter Huckvale,
Medicine Hat, Alta.



Mr. W. X. Wright
Member Executive Committee from Cypress Hills Water Users Association, Maple Creek, Sask.



Mr H. W. Grunsky, Water Rights Branch, British Columbia Government

Professor W. J. Elliott, Principal Provincial Agricultural School, Olds, Alta.

THIRD ANNUAL CONGRESS, OREGON IRRIGATION CONGRESS.

In accordance with your resolution authorizing the executive to appoint two or more delegates, a delegation consisting of the Honourable Duncan Marshall, F. H. Peters, O. Kirkwold, Wm. Young and your secretary, attended the Third Oregon Irrigation Congress held at Portland on February 13 and 14. Your delegation was very courteously received, were the guests at a luncheon tendered by the Commercial Club on Friday, the 13th, and were given the entire evening of Friday to address the delegates under the head of "Lessons on Canadian Methods." There was no expense to the Association in the visit of the delegation to Portland.

The Honourable Duncan Marshall, Minister of Agriculture for the province of Alberta, spoke on "Agricultural Education and Live Stock as Related to Irrigation Farming." Wm. Young, (representing the Honourable W. R. Ross, Minister of Lands for British Columbia, and the President), spoke on "Irrigation in British Columbia." F. H. Peters, Dominion Commissioner of Irrigation, Calgary, outlined "Irrigation in the Prairie Provinces." Your secretary also spoke briefly, extending greetings from your association to the Oregon gathering and expressing the hope that the delegation would take part in our convention at Penticton.

Mr. Marshall's address was a splendid one, arousing enthusiasm on all sides and bringing him an ovation at its close. President Thompson said at its conclusion and referring to the visit of the Canadian Delegation "that they had thought Secretary Hinkle had made a mistake in inviting the Canadian delegation over there, but they wanted now to say to him that he had made no mistake, and that the visit of the Canadians had assisted agriculture and irrigation in their state more than they could tell." He congratulated Secretary Hinkle and the delegates, for having had the opportunity of listening to them.

The newspapers of Portland treated the delegation with much courtesy, both in their accounts of the addresses and by photographing the delegates and furnishing copies of the photographs for reproduction; a copy of one of such photograph will be found in this report.

Your secretary was able to announce that the International Irrigation Congress would be held in Calgary, in September, and sent the following telegram to the Honourable Mr. Ross:

> "Western Canada Irrigation Association delegation here today unite in expressing regret at your inability to be present and assure you that we are upholding the dignity of your Association and the aggressiveness of our country."
>
> NORMAN S. RANKIN
> DUNCAN MARSHALL
> O. KIRKWOLD
> F. H. PETERS
> WILLIAM YOUNG

to which Mr. Ross replied fittingly.

Canadian delegates at Oregon Irrigation Congress, Portland, Oregon, February, 1914.

The Canadian Press were sent the following wire on the evening of the 14th:—

> "Oregon Irrigation Congress opened to-day with two hundred seventy delegates attending. Alberta delegation of four, led by Duncan Marshall, attracts much attention. Canadian guests of Commercial Club at luncheon; given freedom of city by mayor and occupied seats of honour on platform. Entire evening's programme 13th devoted to addresses by Canadians. Secretary Irrigation Association, Calgary, extended greetings from Western Canada Irrigation Association and invited Oregon to send delegation to Penticton Convention this summer. Announced the fact that International Irrigation Congress would be held in Calgary in September, which caused much enthusiasm, many stating intended to come and participate. Dominion Commissioner Peters outlined irrigation law and existing and future prospects. Wm. Young, British Columbia, representing the Hon. Minister Ross, outlined similar conditions in British Columbia. Speech of evening that of the Hon. Duncan Marshall, Minister of Agriculture, on live stock and agriculture in Alberta; spoke hour and a quarter and received ovation at conclusion. Peters gave credit to J. S. Dennis and William Pearce for irrigation inception and development in Alberta and Saskatchewan. At conclusion motion proposed carried unanimously that delegations from Oregon attend the International Irrigation Congress at Calgary and the Western Canada Irrigation Association, Penticton. Great interest manifested Western Canada and all things Canadian."

Your secretary reported at length to your executive all matters of interest connected with the congress.

It is apparent that exchanges of delegations between these congresses is resulting in much publicity for irrigation in Western Canada.

REVISION OF MEMBERSHIP AND REPRESENTATION.

One of the important resolutions passed by the Convention at the Lethbridge meeting was that dealing with the revision of membership and representation to the Convention. This was brought about owing to the fact that year after year delegates in spite of the fact that they are advised in the *Official Call* to bring proper credentials from the proper authorization, have not done so; forty-four of those attending the Seventh Annual Convention being delinquent in this respect. The matter was discussed by the meeting and a committee consisting of Messrs. William Pearce, Dr. C. W. Dickson, and E. Foley-Bennett appointed to look into the matter and report back to the executive in sufficient time to allow of their recommendation being brought into force by the Eighth Annual Convention. I am glad to report that this step has been duly taken, and the official memorandum of appointment and official certificate of appointment used here to-day are the result of the committee's action, and were sent to all delegates with the *Official Call*. Each delegate is required to fill out the two certificates, have them signed by the proper authority, forward the memorandum by mail to the local secretary at the point where the convention is to be held, and bring the certificate with him for presentation at registration headquarters upon arrival. This has eliminated the difficulty heretofore met with in deciding who are properly delegates (with all a delegate's privileges) to the convention.

Official

Memorandum of Appointment

as a Delegate to the Eighth Annual Convention to be held at Penticton, British Columbia, August 17, 18 ——— & 19, 1914 ———

FILL OUT AND RETURN TO THE SECRETARY OF THE ASSOCIATION

This is to Certify *that, pursuant to the official call, I have appointed and commissioned*

Name _____

Address _____

City _____

State _____

To Represent _____

_____

at the Eighth Annual Convention of the Western Canada Irrigation Association, to be held at Penticton, British Columbia, August 17, 18 & 19, inclusive, 1914.

In Witness Whereof, *I have hereunto set my hand this* _____

day of _____ *1914*

_____

_____

THIS MEMORANDUM IS TO BE FILLED OUT SIMILAR TO THE ACCOMPANYING CERTIFICATE, AND MAILED TO THE LOCAL SECRETARY OF THE EIGHTH ANNUAL CONVENTION AT PENTICTON, BRITISH COLUMBIA.

Official

Certificate of Appointment

as a Delegate to the Eighth Annual Convention to be held at Penticton, British Columbia August 17, 18 & 19, 1914

This is to Certify *that, pursuant to the official call, I have appointed and commissioned*

Name _____

Address _____

City _____

State _____

To Represent _____

_____

at the Eighth Annual Convention of the Western Canada Irrigation Association, to be held at Penticton, British Columbia, August 17, 18, & 19, inclusive, 1914

In Witness Whereof *I have hereunto set my hand this* _____ *day of* _____ *1914.*

_____

_____

ON ARRIVING AT THE CONVENTION, DELEGATE SHOULD PRESENT THIS CERTIFICATE, PROPERLY FILLED IN AND SIGNED BY THE PRESIDENT, SECRETARY, MAYOR OR OTHER AUTHORIZED OFFICER OF THE NEWSPAPER, RAILWAY, SOCIETY, COMPANY, ASSOCIATION, CITY, TOWN, BOARD OF TRADE, DEMONSTRATION FARM OR BODY HE REPRESENTS, AT THE REGISTRATION HEADQUARTERS, WHEN OFFICIAL BADGE WILL BE FURNISHED AND DELEGATE ENTITLED TO ALL THE RIGHTS OF THE MEETING, SUBJECT TO THE REPORT OF THE COMMITTEE ON CREDENTIALS.

This committee were also charged with the matter of further exciting public attention sufficiently to bring larger representation from the farming districts to our prairie conventions, and will no doubt have suggestions to be laid before the meeting here to-day.

PUBLIC IRRIGATION CORPORATION BILL.

In November, Dr. C. W. Dickson, who was then in Vancouver, was appointed a special commitee of one to go to Victoria and look into matters in connection with the Public Irrigation Corporation Bill then before the Government, and report fully at an executive meeting to be held in Vancouver, December 15. Prior to that meeting, however, the committee reported as follows:—

> "I secured a copy of the last printed draft of the Irrigation Bill and studied some of its principal features, getting a number of outside opinions on it. The conclusion was that the Bill in that form was utterly impossible from numerous points of view. I also wrote to the Hon. W. R. Ross, telling him the substance of my letter from the executive, and asking for an early appointment to discuss matters. To this letter, I received no reply.
>
> "In the meantime, a long article appeared in the press, apparently written with authority, outlining a proposed new Government measure. (See Vancouver *Province*, November 27, page 3.) This item caused Mr. W. R. Pooley, of Kelowna, to make a trip to Victoria, and I accompanied him. We had interviews with the Hon. W. R. Ross, Mr. William Young, Comptroller of Water Rights, and Mr. E. W. Grunsky, who has been framing the Bill. Mr. Grunsky has prepared a report on the water question, and has entirely re-drafted the Bill to try and meet objections to the first attempt. Both report and draft are still in typewritten form, and have just been submitted to the Minister, who at the date of our visit had not been giving them his consideration. Mr. Ross intends to have the Bill printed after he has looked it over, but did not think this would be possible in time to place it in our hands for the executive meeting on the 15th of this month. In the meantime, the department is unwilling to give out information as to details, in view of possible alterations that may be made before the draft is printed.
>
> "This is the situation to date and unless something new develops within a week, I will have very little to report on the matter. Mr. Young and Mr. Grunsky might come over to meet our committee if they received a special invitation. I should also like to see a representative or two from irrigation interests, to get their point of view."

Upon instructions of the Executive Committee, Dr. Dickson then invited the Hon. Minister of Lands to send Messrs. William Young and H. W. Grunsky of the Provincial Water Rights Branch of the Land Department to attend our executive meeting at Vancouver on the 15th, and make an exposition of the Bill, which invitation was accepted. The committee, under the chairmanship of the Hon. W. R. Ross, convened at the Vancouver hotel, eight out of the total eleven attending, with Messrs. Dennis, Fulton, and Hays unable to be present. After the regular routine business had been disposed of, Mr. Grunsky outlined briefly the proposed new Irrigation Bill, which underwent discussion, after which the president appointed a committee consisting of Messrs. E. Foley-Bennett, J. C. Dufresne, Vernon, and Fred. Anderson, Kamloops, to devise ways and means of obtaining the widest possible publicity in order to get the opinion of the public, promising ample time for the consideration of the Bill by all irrigation interests. President Ross expressed his appreciation of the interest which the W. C. I. A. were taking in this matter.

On January 23, the committee received copies of this Bill, Mr. Bennett advising that he had appointed representative men from different centres south of Vernon, and had written Mr. Dufresne at Vernon, and Mr. Anderson at Kamloops, to do the same in their respective districts, calling a joint meeting of the whole committee on January 30 at the Incola Hotel, Penticton. In his letter of advice, Mr. Bennett said: "The action of the executive in having this committee appointed is warmly approved by the whole of this district and I trust that the report of the committee will meet the approval of the department."

Following is the report of that committee (which may be seen on the table files) dealing with the Okanagan territory:—

A committee meeting was held at the Incola Hotel, Penticton, on January 30, 1914, at 8 p.m.

PRESENT: E. Foley-Bennett, in the chair; W. T. Shatford and P. H. Eraut representing Penticton and southern country; C. H. Cordy, Summerland; Scott-Blackwood, Westbank; and J. C. Dufresne and A. E. Ashcroft, Vernon.

The chairman explained the purpose of the meeting, and it was decided to take up the Act, page by page; whereupon the following suggestions were made and unanimously adopted:—

Clause 2, page 9.—Under definition of system, that the words "twenty-acre tract" in the fourth line be struck out, and "parcel of land" substituted.

Clause 2, page 9.—Under "irrigable lands" that the word "improvements" in the last line be replaced by the words "buildings and curtailage." Explanation dealing with above suggestion: Present clause would be inconsistent with interpretation of "improvements."

Clause 2, page 10.—After the word "person" in the second line from the top of page 10, insert the words "or body corporate." This clause should also include the holder of a sale agreement under the terms of which he is liable to pay taxes.

Page 10, section 4.—Should also provide for corporate seal.

Page 12, section 6, subsection 4, clause "F."—The committee would ask that this section be struck out, and that the Government be asked to stand this additional expense, recouping themselves therefor in the same manner as for their engineering investigations.

Explanation of the above clause: The committee felt that the raising of funds in advance of incorporation would make the work of the originators of any irrigation scheme under this Bill more difficult.

Page 16, clause 16—That a clause be inserted whereby all nominations for the office of assessor be approved by the board.

Page 17, section 17, subsection 2—Strike out the words "resident of this province" in the fifth line.

Explanation of the above suggestion: It is customary for the land owners living out of the province to have their lands planted in orchards, intending to live on these lands when the orchards come into bearing, and it was felt that in

order to encourage the investment of capital, absentees should have a voice in all matters pertaining to water corporations in which they are interested.

Page 22, section 25—Provisions should be made for qualified voters' names being added after the list has been certified correct and closed as per Municipal Act.

Page 28, section 31, subsection 1—Strike out the word "male" in the second line, and the words "British subjects" in the third line, and substitute therefor the word "elector."

Explanation of the above suggestion: It was felt by the committee that any land owner chosen by the community, whether male or female, British subject or not, should be eligible to represent that community. It was also pointed out that there are certain settlements of Forcijuros, who would find it practically impossible to obtain British representatives as trustees, which, if insisted upon, would militate against the investment of foreign capital.

Section 31, subsection 2, clause "G"—That this clause be struck out.

Section 31, subsection 1—That the words "territorial limits" in the fifth line, be struck out, and "province of British Columbia" be substituted.

Page 29, section 23—That a penalty clause of $50 (fifty dollars) be inserted for any trustee refusing to sit after being elected as per "Municipal Clauses Act."

Page 30, section 33, subsection "B"—That provisions be made for trustees holding office for three years, one-third to retire each year.

Explanation of the above suggestion: The point was particularly urged by P. H. Eraut, who has had the supervision of the Penticton irrigation for several years; who urged that it was imperative to have in office a certain number of trustees who had former experience. The committee was thoroughly in accord with this suggestion.

Page 31, section 35—Insert penalty clause for trustees refusing to take office as per "Municipal Clauses Act."

Page 34, section 50, subsection "B"—If this section does not already empower telephone hours for the operation of the system, the committee thought it would be well to do so, and suggest the following wording:

"The trustees may provide telephone service for the economical operation of all parts of the system; and have the right to erect poles and string wires across or along any roads or right of way; and where necessary, across any lands, whether Crown lands, private or municipal property."

Page 41, section 57—It was felt by the committee that the trustees should be allowed to spend up to a certain amount, say $500 (five hundred dollars), on their own responsibility in case of emergency.

Page 44, section 61—Should have fair wage clause and prohibition on Asiatic labour clause, as per "Municipal Clauses Act."

Page 45, section 60—Provisions to be made, whereby by-laws would cite bonded indebtedness of corporation, as per "Municipal Clauses Act."

Signed:

E. FOLEY-BENNETT	Chairman.
J. C. DUFRESNE	
W. T. SHATFORD	
P. H. ERAUT	Committee.
A. E. ASHCROFT	
SCOTT-BLACKWOOD	
C. H. CORDY	

Your secretary wrote to Mr. Anderson, who did not attend the Penticton meeting, sending him a copy of the Okanagan meeting recommendations, and asking for his endorsation or criticism, suggesting that he call upon Mr. Fulton, and discuss the matter with him. Following is Mr. Anderson's letter:

KAMLOOPS, B.C., February 21, 1914.

NORMAN S. RANKIN,
Secretary, W.C.I.A.,
Calgary, Alberta.

SIR,—I duly received yours of the 10th instant. The recommendations made by the committee at the meeting held in Penticton, January 30, 1914, are satisfactory to me.

It is very difficult to get a fair consensus of opinion on the proposed "Public Irrigation Corporation Bill," as the idea is really foreign to those interested in irrigation in this district. Personally, I think it is pretty heavy machinery for the rather small watershed in this district, but other parts will most likely be able to utilize such an Act to better advantage.

From good authority in the United States it appears that private operation by irrigation corporations has not been very successful financially and, personally, I think that the Provincial Government should undertake the full construction, operation, and contract of the required works.

It is not easy to see why the Government should not undertake works of this nature. If it cannot be made profitable under private operation it does not seem that there would be very much chance of a more favourable result under Government operation. In short, if the Government can afford to build the works and lose the interest on the investment, as is being done in the United States, ultimately these works may repay their cost. The value of the interest lost to the Government is made up many fold by the benefits to the community as a whole.

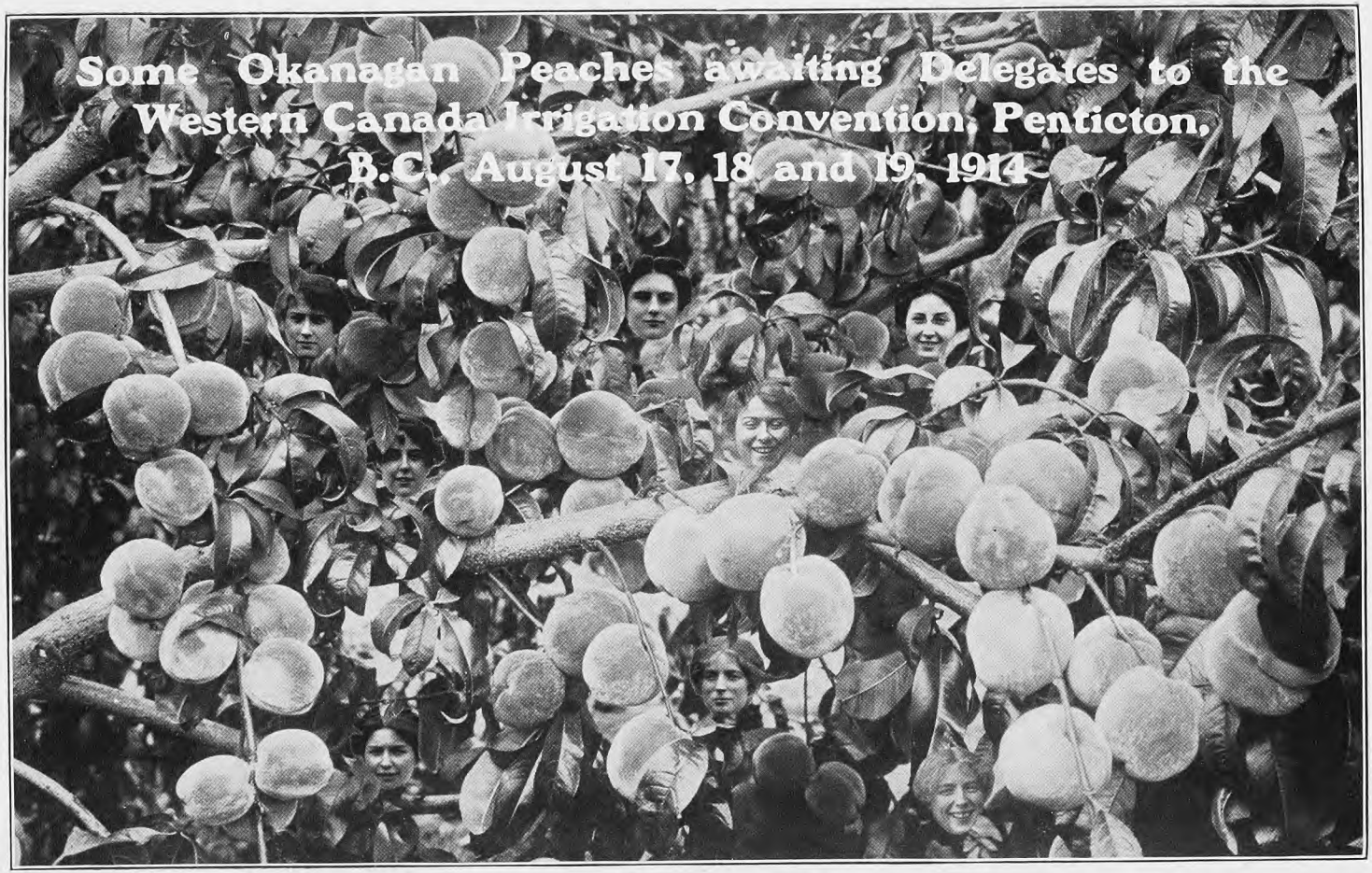
It is interesting to note that the average cost of water in the United States from Government works is about $12 per acre less than from recent private works of comparable size. This difference is accentuated by the greater probability of the water users under Government projects receiving an adequate water supply, as this matter has been given more careful consideration and deficiency guarded against with greater care than in private investments.

I am, sir,

Respectfully yours,

F. W. ANDERSON, *C.E.*

Copies of these recommendations and all communications were sent to the executive as they came in.



One of the Post Cards used to advertise the Convention.

Copy of the report as submitted by Mr. Foley-Bennett was at once forwarded to the Honourable Minister of Lands, to which Mr. Grunsky replied as follows:

VICTORIA, B.C., March 6, 1914.

NORMAN S. RANKIN, Esq.,
Secretary, W.C.I.A.,
Calgary, Alberta.

Re Public Irrigation Corporation Bill.

DEAR SIR,—The Minister turned over to me the report of the committee held under the auspices of the Western Canada Irrigation Association concerning the Irrigation Bill before the Legislature. Prior to the time when this report reached here, it had been decided to incorporate the Irrigation Bill into the Water Act itself, and time did not permit all the suggested changes to be made. Nevertheless, all those which were approved and which bore on the organization of the corporation were carefully considered and, for the most part, incorporated. It was thought that such of the others as are approved could be introduced next year, and that in the meantime their absence will not seriously interfere with the formation and conducting of any public irrigation corporation.

Very truly yours,
H. W. GRUNSKY.

CLOSER COMMUNICATION BETWEEN WATER USERS AND GOVERNMENT.

The resolution bearing on this matter may properly be divided into two heads, namely:—

(*a*) The establishment of sub-irrigation offices,

(*b*) The establishment of demonstration farms,

both of which were promptly taken up with the Dominion and three Western Provincial Governments. To the first head, which covers also a resolution from the Cypress Hills Water Users' Association to the Dominion Government, the Dominion Minister of Agriculture refers the matter, under date of September 8, to the Hon. Minister of the Interior, who referred it through Superintendent of Irrigation Drake to Commissioner of Irrigation Peters at Calgary. Mr. Peters' reply is to the effect that "This matter had been brought up to him previously by the Cypress Hills Water Users, and at that time he had replied that the time was not yet ripe for such an advance." This covered the Dominion and the Saskatchewan and Alberta Governments.

The British Columbia Government replied by letter from the Hon. Minister of Lands, W. R. Ross, under date of December 10, as follows:—

VICTORIA, December 10, 1913.

NORMAN S. RANKIN,
Western Canada Irrigation Association,
Calgary, Alberta.

DEAR SIR,—I beg to acknowledge your letter of December 6, with enclosed resolution No. 3, passed by the Western Canada Irrigation Association at their convention at Lethbridge.

I have, for some time, fully realized the situation as outlined in the resolution so in the reorganization of our Water Rights Branch the object has been not only an efficient system, but a capable staff who would administer in the interests of the public as a whole.

Before giving you an outline of the reorganized Water Branch and its work, I wish to direct your attention to the difficulty under present methods of administration of establishing, by the Department of Lands, of demonstration farms

at such points as will meet the particular requirements of the country, as suggested in the resolution. This difficulty lies in the fact that administration and operation of the experimental farms comes under the Agricultural Department. This feature of the resolution should go before it and, on receiving favourable consideration, water rights may be acquired in the usual way, and such assistance as would be necessary in the installation of an irrigation system would be available in the Water Rights Branch.

The amendments to the Water Act at the last session of Parliament provided the necessary machinery for administration and forthwith organization was undertaken. The Board of Investigation was reorganized with new powers, a Comptroller of Water Rights appointed thereto, and the staff of the general office at Victoria increased early in March. Sub-offices were opened for the district engineers in Cranbrook, Revelstoke, Nelson, Grand Forks, Penticton, Nicola, and Kamloops.

Inasmuch as the resolution refers particularly to district engineers, I would call your attention to the powers under the amended Act, they have, and the order of work laid down for them by the Comptroller of Water Rights. The powers in question are set out in section 205 of the Act, a copy of which you will have. Since "beneficial use" is the keynote of the Act, you will note how such powers will bring the engineer into close touch with the water user. The order of work as laid down is as follows:

1. Engineering investigation of old records.
2. Systematic and continuous work in stream measurement.
3. Study of the duty of water.
4. The prevention of wasteful use of water.
5. Policing of streams.
6. Economic distribution and delivery of water.
7. Inspecting water systems to determine their efficiency and safety.
8. Determination of storage possibilities.
9. Investigation of water-powers.

The "Investigation of old records" is first because of its great importance. On the whole, there are some 8,000 old records throughout the province that must be carefully gone into and determinations arrived at before we can hope to properly administer water in all districts. For this purpose the Board of Investigation was created with special powers. It has been found from experience that before the Board can intelligently take up a record they must have an engineering report showing what use is being made of the water. In the districts south of the railway belt, this work is progressing rapidly and is now so far advanced that in looking forward to next season our district engineers will be in a position to take up the work that will be of advantage to individual water users and the district as a whole.

With regard to "systematic and continuous work in stream measurements" inasmuch as the Dominion Government decided to maintain their Hydrographic Survey in the railway belt, after turning over the water administration to the province, it was realized by both Dominion and Provincial officials that if best results were to be obtained, this work should be under one head. Accordingly the "British Columbia Hydrographic Survey" was organized with headquarters in Vancouver, under Dominion supervision and with Provincial co-operation. This arrangement has now been working five months, and has proven satisfactory. The gain for the province has been the acquirement of the services of a staff of trained hydrographic engineers. While it is not expected that they will reach out to every part of the province at once, considerable progress has been made. The Water Rights Branch is doing its share, and where gauges have been established such are gradually going under the supervision of the Hydrographic Survey.

In the matter of the "study of the proper duty of water" our experience this season has been that it will be more advantageous if it were taken care of by a special department under the Water Branch. During the winter, a capable man with agricultural training will be employed to take charge of this work. We will have the co-operation of the district engineers and their assistance.

By means of the arrangement of hydrographic surveys and the organization of the Duty of Water Department, the district engineer will, to a great extent, be free to give the greater portion of his time to those important matters as set out in items 4, 5, 6 and 7, as above.

One of the most important lines of work is the "determination of storage possibilities" in some of the districts, particularly the Okanagan. Plans are now being made for the coming season. Such work will include topographic surveys to determine drainage areas. It is impossible to state just how much of this work we can accomplish in one season, but a special effort will be made to cover as much of the country around Okanagan lake as possible, without jeopardizing thoroughness.

In some of the districts where irrigation matters are not so contentious, we will spend some time on the "Investigation of water-powers." Many small water-powers are being neglected, which if developed would be of great advantage locally. What is required to bring these powers to the attention of the public is investigation that will show what the economic development in each instance will be. As regards the importance of small water-powers for irrigation purposes, investigation has in one instance shown that 6,350 acres have been brought under irrigation through pumping by electricity to an elevation of 104 feet, the amount of electricity used being 1,000 horse-power. In this respect it would be of exceptional interest to know what acreage of land around Okanagan lake would come within the 100-foot contour, and the various water-powers that might be made use of. I merely draw your attention to this that you may see we are alive to the situation and that the work as outlined, when carried into effect, will be of some value in solving many water problems.

Referring again to our sub-offices, which with one exception have been in existence since March, the experience of the season has shown them to be of great assistance to water users. Their success, however, depends on the men in charge.

In conclusion, I would like to add that we have given the water administration of British Columbia careful study. The organization of effective administration machinery is not one of a few months, but one of evolution and will take time. Many factors enter into the problem and, being an economic one, in our desire to establish sound principles,we have perhaps, made haste slowly.

Yours very truly,

W. R. Ross,
Minister of Lands.

DOMINION GOVERNMENT.

To the second head, the establishment of demonstration farms, the Hon. Minister of Agriculture writes from Ottawa as follows:—

Ottawa, September 8, 1914.

Norman S. Rankin, Esq.,
Secretary, W.C.I.A.,
Calgary, Alberta.

Dear Sir,—I am directed to acknowledge the receipt of your letter of the 31st ultimo, embodying a resolution passed at the recent convention of the Western Canada Irrigation Association, held in Lethbridge. The Minister has

carefully noted the recommendation that demonstration farms should be estalished in the irrigation districts of the West, and wishes me to point out that demonstration work is more a matter for the Provincial than the Dominion authorities. There is a Dominion Experimental Farm in the vicinity of Lethbridge, where irrigation is practised. There is also one at Invermere, B.C., and before very long, a new farm will be established in the Okanagan district. It is suggested that the question of providing demonstration farms for the different districts should be taken up with the Provincial Departments of Agriculture concerned.

That portion of the resolution suggesting the establishment of sub-irrigation offices or the periodical visiting of a qualified officer to enable water users to obtain information and advice, concerns the Minister of the Interior, and it is being brought to his attention.

Yours faithfully,

WM. IDE,
Private Secretary.

SASKATCHEWAN.

The Hon. W. R. Motherwell, Minister of Agriculture for Saskatchewan, replied on December 15, and April 28, as follows:—

REGINA, SASKATCHEWAN, December 15, 1913.

DEAR MR. RANKIN,—I have for acknowledgment your favour of the 6th instant, enclosing copy of resolution No. 3, passed by the Western Canada Irrigation Association at their convention held in Lethbridge last August, which resolution I have noted carefully.

I may say for your information that the matter of establishing small demonstration farms in this province is at present receiving the consideration of the authorities of the College of Agriculture, and I have no doubt but that something will be done along this line in the not very distant future.

Yours very truly,

W. R. MOTHERWELL.

REGINA, SASKATCHEWAN, April 28, 1914.

DEAR MR. RANKIN,—Replying to your favour of the 20th instant, *re* demonstration farms in this province, I regret that I have nothing further to add to my letter of December 15 last, with reference to this question. This matter is receiving the consideration of the college authorities, but no definite policy has yet been announced by them.

W. R. MOTHERWELL.

ALBERTA.

The Hon. Duncan Marshall, Minister of Agriculture, replied as follows:—

EDMONTON, December 31, 1913.

DEAR SIR,—I have your letter and might say that it is not the intention of our Government to immediately establish any further demonstration farms,

although it is our policy just as soon as these farms are well under way and there is a demand for more farms and schools, to establish further ones, and when that is taken up, we will certainly keep the irrigation requirements of the province in mind.

Yours very truly,

DUNCAN MARSHALL.

The policy of the Alberta Government in this connection as set forth by the Hon. Mr. Marshall, in a previous request was as follows:—

DEAR SIR,—I have your letter asking what steps the Government has taken in the establishment of an agricultural college, and in reply would enclose memorandum of what we propose doing in agricultural education, from which you will see that it is not our present intention to immediately establish an agricultural college.

Yours very truly,

DUNCAN MARSHALL,
Minister of Agriculture.

MEMORANDUM.

The policy of the Alberta Government is to erect upon two or three of the demonstration farms, agricultural schools to be supplemented by other schools as the demand grows; to begin in these schools with a three months' course, at the end of which term a diploma will be granted in practical agriculture, this diploma to be an entrance to the agricultural college to be established later on, where the scientific course in agriculture will be given to the man who wishes to obtain the degree of bachelor of scientific agriculture. The exact details of these courses will, of course, be determined as the system is developed, but it is intended that they shall include instructions in live stock and grain, soil cultivation, dairying, poultry raising, courses in mechanical work, such as blacksmithing and carpenter work as is required on the farm, courses in the operation of gasoline and steam engines, and instruction for girls in domestic science. By establishing these schools in different parts of the province they will be easy of access to farmers' sons, and experience has gone to show that the nearer you can bring a school to the farmer's boy, the better chance he has of availing himself of its instruction. These schools will be placed on the demonstration farms and there the students will have the very great advantage of the practical work done on the farm. They will be able to observe from day to day the application of scientific methods to a farm no larger than most farmers in the province occupy, and this land being operated with a view to making its occupation profitable. It is quite true that in the erection of an agricultural college it is comparatively easy to build what will be a bigger show place with the appearance of doing greater things, but that is not our object in this province. Our determination is to bring scientific instruction in agriculture as near home to the farmers in different parts of the province as possible.

BRITISH COLUMBIA.

VICTORIA, December 15, 1913.

DEAR MR. RANKIN,—Your letter of the 6th instant, enclosing resolution No. 3, which arrived during my absence, has been duly brought to my attention.

In reply I may say that the department has had in operation some demonstration orchards; but we have now decided definitely to make some general demonstration along the line of agriculture in the different sections of the province. We have already made several selections of land, and the work will be carried out under the supervision of our experts connected with the Agricultural Department.

Wishing you the compliments of the season,

Yours sincerely,

PRICE ELLISON,
Minister of Finance.

OFFICIAL REPORT.

The official report was in the hands of the Government at Ottawa for publication inside a month after the close of the convention at Lethbridge, but owing to an exceptionally heavy run of governmental printing it was not turned out until March. Total issue amounted to 2,500 copies, which now seems to be inadequate, as I had call for over 500 additional copies. The association is growing in membership and the demand for additional copies comes not only from these new delegates, but from those interested in irrigation south of the line, and from many public and private libraries. We should have at least 3,000 for distribution this year. Appended is a letter from the office of the superintendent in the premises:—

OTTAWA, March 17, 1914.

SIR,—I beg to acknowledge the receipt of your letter of the 12th instant requesting to be supplied with 500 more copies of the report of the Seventh Annual Convention of the Western Canada Irrigation Association.

In reply I beg to state that only 2,500 copies of this report were printed. It was thought that this would be a liberal supply sufficient to meet all requests that might be made for same. Of this number, 2,000 copies were sent direct to you; 50 copies to the Commissioner of Irrigation for distribution amongst the members of his staff; one copy was mailed direct from this office to each of the delegates at the convention, totalling 125 copies. This left 325 copies which were retained here for general distribution. Of this number, only some 50 or 60 copies remain. I regret, therefore, that I am unable to comply with your request. Next year, when having this report printed, we will ask for a larger number.

Your obedient servant,

W. M. BAILEY,
For Superintendent of Irrigation.

Some 1,200 bulletins on alfalfa were supplied by the Dominion Government through Vice-President Fairfield and sent to our mailing list. Within a month from their issue, dozens of inquiries began to come in for additional copies, which indicates the general interest that is being taken by the farmers in the culture of alfalfa.

The association is indebted to Mr. F. H. Peters for securing from the Government for illustration here to-day and elsewhere, large photographs and small wooden models showing the best and handiest types of farmers' wooden headgates

both completed and at different stages of construction. It is Mr. Peters' idea that this will assist in making clear to the farmers the proper way to build such headgates, dimensions, etc.

GOVERNMENT GRANTS.

The association is indebted to the Dominion Government for a renewal of their grant of $500.

The association is indebted to the British Columbia Government for a renewal of their grant of last year of $1,000.

The association is indebted to the Alberta Government for a grant of $500. This gave us a working capital of $2,000 for the year.

In order that the Governments who assist us yearly with grants, and the delegates may know how this money is expended, I attach herewith a comparative statement of actual expenses incurred at the last two conventions, and upon which the expenses of the present meeting is based. There is not included in these statements working expenses for the period between conventions, such as the sending of delegations to irrigation congresses in the United States, stationery, printing, stamps, executive meetings, etc. The expense of the executive meeting at Vancouver on December 8, the agenda of whose meeting is given, approximated $300.

COMPARATIVE STATEMENT OF EXPENSES INCURRED AT THE KELOWNA AND LETHBRIDGE CONVENTIONS, AUGUST 1912 AND 1913.

		Kelowna 1912	Lethbridge 1913
Transportation expenses of four speakers, including secretary and assistant		$ 569 15	
Transportation and expenses of three speakers, including secretary and assistant			314 78
Stenographer's report, including hotel and travelling expenses			172 80
Stenographer's report including hotel and travelling expenses		187 65	
Grant expended by local Board of Control which covers hire of hall, local arrangements and local printing	$ 500 00		
Printing, badges, engraving, cuts, etc., on account of convention, incurred at Calgary	359 15	859 15	
Printing at Calgary account convention	299 70		
Salary or bonus to local secretary	200 00		
Hire of theatre for three days, and moving picture hall	163 60		
General and local expenses, stamps, photos, badges, ushers, advertising, cuts, etc	363 76		1,027 06
		$ 1,615 95	$ 1,514 64

NOTES.

Kelowna paid the local secretary's salary for four months at $100 per month.

Kelowna, from grant of $500, settled local printing accounts, hire of hall and other general expenses. The City Council had a small deficit on account of entertaining to make up.

Kelowna's convention lasted four days.

Kelowna's expense for bringing in speakers was materially higher than Lethbridge's on account of greater distance from international boundary.

Lethbridge City Council and Board of Trade made a grant of $500 to cover expenses of general entertainment, banquet, and picnic luncheon. Expenses incurred at Lethbridge not met with at Kelowna:—

Hire of theatre	$ 163 60	
Bonos to local secretary	200 00	$ 363 60

Lethbridge convention lasted three days only.

EXECUTIVE COMMITTEE MEETING, VANCOUVER, DECEMBER 15, 1913, VANCOUVER HOTEL.

Agenda.

1. Roll call of officials.
2. Minutes of last meeting.
3. Financial report.
   (*a*) Cost of Lethbridge Convention.
   (*b*) Cost of Kelowna Convention.
   (*c*) Grants for 1914.
   (*d*) Balance in bank, December 1, 1913.
4. Resolutions.
   Report on status of resolutions passed at Lethbridge Convention.
   (Resolutions Nos. 1, 3, 4, and 5.)
5. Report of Committee on Membership and Credentials.
   (Resolution No. 6.)
   Wm. Pearce, Chairman.
   Dr. C. W. Dickson.
   Mr. E. Foley-Bennett.
6. Appointment of Delegation to Oregon Irrigation Congress.
   (Resolution No. 2.)
7. Report on advisability of formation of Special British Columbia Committee.
   Messrs. Lawrence and Stobart, proposers.
   (Resolution No. 10, 1912)
8. Discussion of Penticton Convention.
   (*a*) Speakers
   (*b*) Special features
   (*c*) Special railway rates, file 5,421.
9. New business.
   British Columbia Irrigation Bill.
10. Adjournment.

FORMATION OF SPECIAL BRITISH COLUMBIA COMMITTEE.

At the executive committee meeting held in Vancouver, December 15, the matter of the advisability of the formation of a special British Columbia committee to deal with matters in that province, as brought up by Mr. C. E. Lawrence, at the Lethbridge Convention, was discussed and votes registered from British Columbia delegates, who were in attendance at the Lethbridge Convention, and who were requested by letter to tabulate their vote. The resolution was defeated and the matter tabled, the secretary being instructed to advise the proposer and seconder that the matter would be considered at the Penticton Convention if they then desired to bring it up again. The following letter was sent to Mr. Laurence by your secretary:—

VANCOUVER, December 16, 1913.

DEAR MR. LAURENCE,—Your resolution regarding the formation of a special British Columbia Committee to deal with irrigation and agricultural matters, keep in touch with the Federal and Provincial Governments, etc., came before the executive committee yesterday afternoon. Only votes were recorded from those British Columbia delegates who were in attendance at the Lethbridge Convention, nor did the executive vote, other than the British Columbia members who attended that convention. The resolution was defeated. The executive, however, did not declare the resolution lost, but ordered it tabled to be brought up at the desire of the proposer at the Penticton Convention.

In discussing the matter after registration of the vote, it seemed to be the opinion of the executive that the formation of such a committee as you proposed was no longer necessary, as the executive committee itself was keeping in pretty close touch with the Government regarding all irrigation matters, this meeting demonstrating the interests they were taking, eight out of eleven being present.

A special committee of three, with power to add to their numbers, was appointed to take up the discussion of the proposed Irrigation Bill in their various localities, of which Mr. F. Anderson, of Kamloops, was made a member.

I have sent full details of the executive meeting to Mr. F. J. Fulton, who was not present, from whom you can get them.

I will put your resolution on the programme to be brought before the Penticton meeting, if you will so advise me.

Yours faithfully,

NORMAN S. RANKIN.

The file dealing with this matter (No. 10) may be seen on the table by the door amongst the other files, by any one who is interested in this matter.

GENERAL.

During the committee meeting at Vancouver in December, President the Honourable W. R. Ross, was the guest at the Progress Club, along with the members of the executive committee. Mr. Ross addressed the meeting on "Land Settlement and some of its Problems."

Your executive also attended the Forest Fire Conference which was held in Victoria December 15 and 16.

Owing to the change of location from Kelowna to Vancouver, Dr. C. W. Dickson presented his resignation to the executive on December 15, which was accepted, and Mr. J. W. Woolsey, Kelowna, elected in his place. Dr. Dickson having returned to Kelowna in April and Mr. Woolsey leaving there at that time, Dr. Dickson was re-elected to his old position, which he now holds.

Dr. Dickson's letter follows:—

VANCOUVER, B.C., October 22, 1913.

DEAR SIR,—At the Lethbridge Convention of the Western Canada Irrigation Association, I had the honour of being elected to the executive committee of the Association to represent the Kelowna district. As, however, I am no longer resident in that district, and cannot therefore fairly claim to act as its representative, I feel that it is my duty to retire in favour of some one else, who will be in closer touch with the irrigation interests of the Okanagan.

Will you kindly place my resignation before the executive at the earliest possible opportunity, so that my successor may be in a position to co-operate in making the 1914 convention at Penticton an unqualified success.

You will realize that I am taking this step with the deepest regret and after mature consideration, and with the understanding that if I can at any time be of use to the Association, my services are at your command.

Permit me to express my sincere appreciation of the unfailing courtesy extended to me by yourself and other officers of the Association during the several years I have had the pleasure of acting on the executive.

Yours very truly,

C. W. DICKSON.

FINANCIAL STATEMENT, WESTERN CANADA IRRIGATION ASSOCIATION, 1913-14.

Receipts.

1913—Balance carried forward as per bank account		$ 1,849 75
Refund on unexpended portion of emergency cheque (1912-1913) No. 41		40 57
1914—British Columbia Government grant		1,000 00
Alberta Government grant		500 00
Dominion Government Grant		500 00

Expenditures.

1913—Expenses, transportation, etc., speakers to convention at Lethbridge	$ 255 35	
Rent of Majestic Theatre and Moving Picture hall	163 60	
Stenographic report and expenses of stenographer	172 80	
Printing, engraving, stationery, etc	166 71	
Grant and salary to local and permanent secretaries, etc	400 00	
Transportation and expenses, five members executive to attend meeting at Vancouver	253 50	
Secretary's salary for five months	208 30	
1914—Printing programme, official calls, badges, photos, stamps, cuts, folders, postcards, etc.	278 85	
Expense delegates to Oregon Irrigation Congress, Portland	18 05	
Travelling and hotel expenses, meeting of programme committee at Sicamous	105 70	
Grant to local board for Penticton Convention	500 00	
Secretary's salary for seven months	291 62	
Balance in bank	1,075 84	
	$ 3,890 32	$3,890 32

H.J.R.

Certified correct,

NORMAN S. RANKIN.
Permanent Secretary.

NOTE.—$500 less was received this year in grants than last year, and greater expense, $154.94, was necessary for preliminary arrangements of convention, distance from Calgary to Penticton, meeting of executive at Vancouver and meet-

ing of programme committee at Sicamous. Secretary made two trips to Sicamous and one to Penticton. Taking these facts into consideration, the cash balance in bank is about equal to that of last year.

PUBLICITY.

A carefully-thought-out persistent campaign of publicity has been carried out, which began quietly in the month of April and ran through May along the same lines. In June and July we increased the publicity matter issued, and I am glad to report that articles put out to various papers throughout the West have, through their courtesy secured us an approximate circulation of half a million or, to be exact, our articles were accepted by 300 papers in the three western provinces, having a combined circulation of 596,132. I have issued over 300 photographs of officials of the Association, members of the local board, and prominent speakers, and those who care to look over these clippings will find them in a book on the little table in front of the platform. (Applause.)

CHAIRMAN: We have with us to-day, Dr. Frank T. Shutt, Chemist for the Dominion Experimental Farm at Ottawa. He has been connected with the Experimental Farm for many years, and has therefore had an opportunity of watching the development of agriculture in the West from very small beginnings as compared to its present state. Dr. Shutt has always taken a very keen interest in irrigation, not only in British Columbia but in the Prairie Provinces as well, and I have no doubt that his observations will be very interesting.

Dr. SHUTT: Mr. President, ladies and gentlemen, it is needless, I am sure, to assure you of the great pleasure it has given me to be present at this convention and being really an unexpected pleasure, it is all the greater because it is less than a week ago that I was certain that I might be here. I have not travelled from Ottawa all the way to be present with you. As regards irrigation, I know very little about it and am really here as a listener, being anxious to gain what information I can on the subject. I am now in my twenty-seventh year of service, and it was due to the activity of the late Deputy Minister of Agriculture, I think, that I paid my first visit to the province after the establishment of a farm at Agassiz in the earliest days, though there was no irrigation there, the conditions being different. But for several years I came out here and made little cursory agricultural surveys of the valleys which might prove to be of agricultural value in the future—the Okanagan, Nikola, Columbia, Coast, and Vancouver island. It has been my good fortune to watch with much satisfaction the progress that has been made.

I know that mining, of course, takes a prior position, but I have great confidence in the future and expect to see agriculture looming very large in the work and lives of those in this beautiful province. It has very many charms. I cannot recall the first time I came to Penticton, but I well remember a meeting we had of an agricultural nature and I really think I can speak—not egotistically at all—of the good work the Experimental Farm system has done. We cannot, of course, the chief officers, reach all our people personally. We should like to

do that, for great benefit is to be derived from knowing the men and that has been a strong feature in our work, I think, from the first; that there should be no line of demarcation, and that we should get close to the man on the soil and try to understand the difficulties and problems he is up against from his point of view. That has helped us in our purely experimental farm work. We have, of course, instituted, and with much value, experiments of many kinds on our own account, but in a sense I think the more valuable part of our work has been brought about by inquiries received from those on the land. And so we enlist sympathy, and encourage, as much as possible, correspondence, and we endeavour to assist as far as we are able with chemical analyses and with examinations of weeds and insects.

Of course, twenty years ago the provinces did not have much of a staff of experts in botany, entomology and chemistry, but there have been great changes since that time and now in very large measure you in British Columbia have your own officers nearer. Still, in regard to chemistry, there is yet great opportunity for us to help you with soil fertilizers, and fungicides and insecticides; but agricultural chemistry is really interwoven with every branch of farming, whether specialized or general. Therefore, I reiterate the importance and value of it to you. You should take advantage of it, and first of all from your own farm at Lethbridge. In this connection, it is very gratifying to hear Mr. Fairfield spoken of so highly all over the province. (Applause.) Everybody assured me that he is the right man in the right place. Of course, in British Columbia you have other stations, although I mention Mr. Fairfield because he has charge of the only experimental station at the present time in which we experiment with irrigation. Our other stations in British Columbia are carrying on agriculture in a more or less humid climate. Of course, I say nothing as to the future, but I know you are all looking forward to the establishment of something not far from here, and it may come about. We are already at work in the Nikola valley. Our system has grown from five experimental farms to over twenty in active operation.

With regard to conventions, I am a utilitarian myself. I recognize, of course, the value of the social side of this affair. I think that is an admirable part, but I think sometimes there are occasions when we lose sight of the educational side of the question. Perhaps you are not all so serious as I am; life is serious enough, but I think if we can take away only one or two things we shall feel that we have not altogether wasted our time. I am glad to see on the programme a number of very practical subjects. I cannot help you with regard to the use of water on the land; nevertheless, I am very much interested in irrigation, and I have been spending a fortnight in Alberta, studying right from the soil in connection with our analyses, the influence of the application of water on the Canadian Pacific irrigation tract. I had been over it before the water was applied. You are not going to be troubled here as they have been, either climatically or with the soil; nevertheless, one cannot help being impressed with the fact that, as the Hon. Price Ellison has said, there are other things besides the actual application of water.

We have heard much lately of dry farming. It is apparently a new term and a very novel one, but when we look into it, it is merely the emphasizing of

certain features of good farming the world over; it is really the conservation of moisture, and really, it seems to me that it is as necessary for you to practically apply the principles of so-called dry farming as it is with the people east of you on the plains. It is apparent to every one how this country is suffering to-day from lack of moisture, and it is quite evident from what was said this morning that there has not been a sufficiency of water to give to your crops that which is required for their growth and development; and if that is so, how necessary then it is to understand the principles of the conservation of moisture. We have been carrying on experiments on western stations for some time to determine just exactly those cultural operations which will tend to the greatest conservation of all the soil moisture. Conservation of moisture must go hand in hand with the application of water. It has always seemed to me that the man who could get along with the least water, provided he had a sufficiency, is going to be the best off in the long run. You see, a soil when it is full of water is not in the best condition for plant growth.

I must not begin to be didactic on this occasion, but it has been a great pleasure to me to renew old acquaintances all down the valley, and also to make many new friends. I make no lines of distinction between personal and what I might term professional friends. They are all one in agriculture. I am heartily in sympathy with their objects. They assist me and I, in some little measure, endeavour to assist them. I am quite sure our pleasant relationships will continue and I wish you all success and a great deal of pleasure at this convention. (Applause.)

CHAIRMAN: Owing to the fact that some of the speakers have not been able to get here on time this morning, the executive has found it necessary to somewhat change the programme for to-day and part of to-morrow, so that if we do not follow the printed programme literally, you will understand the reason.

We have with us a representative of the Department of Agriculture for the province of Alberta, Mr. George Harcourt, Deputy Minister, who will now speak to us.

MR. HARCOURT: Mr. President, ladies and gentlemen,—I am indeed pleased to be present on this occasion and to renew acquaintances down the valley, having been in Kelowna two years ago. There is a good deal in common between the two provinces, and noticing how dry it was during my journey, I was reminded of some portions of our own province this year. It is not quite as bad, although serious enough, but I think on the whole we will have from 80 to 90 per cent of the crop of last year, and with probably higher prices we will have more money to buy your fruit than perhaps last year.

You don't know how this section of the country appeals to me, with its fruit and possibilities, but probably you will understand it better when I say that I come from the Niagara district, and how I have missed the fruit on the prairie! I hope some day that we will grow quite a bit of fruit on the prairie. Small fruits grow well wherever there is protection and I must say frankly that there is no excuse for any farmer in Alberta not having all the small fruits he wants for his own use. The larger fruits we hope to grow, because where there is shel-

ter we have certain fruits growing that indicate to us that the cultivated fruits will grow, but it may be some time before we have any great success with them.

I am sorry the Minister of Agriculture could not be present. I know he would have enjoyed this trip and I am sure could you have heard his address at Portland, you would have been more than delighted to have heard him. I may say frankly that it was one of the best addresses on agricultural education I have had the pleasure of listening to. He has taken a great interest in agriculture and realizes that it is necessary to put that work in the most attractive form for the people. Of course, we have people from different climates, countries and walks of life attempting to follow agriculture and if it were not the very best profession under the sun, they could not make a success of it, but to reach the highest success, it is necessary to teach these people what to do and how to do it. We have been carrying on an active campaign in taking out instruction to the farmers through short courses and farmers' institutes, and we have taken out carloads of stock to teach desirable lines of conformation. We have gone a step beyond and started schools of agriculture. We have three of these schools instead of one central institute and they have been a success far beyond our most sanguine expectations. Professor Elliott, of the school at Olds, is to speak to you on that subject and we also have here the principal of the school at Claresholm.

I am very pleased to be here for another reason to accept the hospitality of your town, because of the importance of irrigation. While this is the eighth convention of your Association, we are really only beginning to understand irrigation and one of the things we are learning is that we don't know, and when we get to that point, we are in line for progress because we are going to find out. Our farmers started out first to irrigate for grain and not finding that very successful, they are now starting fodder and particularly in Alberta and around east of Lethbridge where it is pretty dry, it is really a sight for sore eyes to see the fields of alfalfa and the abundance of fodder.

I trust that a great deal of good may come out of this convention. The social side is necessary. Farmers, and I suppose fruit growers, are a little too prone not to get out. It is not always what we hear but it is meeting each other and discussing problems between sessions that enables a man to pick up more information and obtain a wider view of the foundation and causes of the great work in which he is engaged, thus more adequately preparing him to carry on his work. I thank you, and I trust that you will have a most successful convention. (Applause.)

CHAIRMAN: We have with us a representative of the Cypress Hills Water Users' Association, Mr. Walter Huckvale, of Medicine Hat.

MR. HUCKVALE: Mr. President, ladies and gentlemen,—I have felt more pleased at being in Penticton for the last twelve hours than just at this moment, and I fully recognize that it is owing to an unfortunate situation in the progress of civilization that has called many of our speakers away that I am called upon to fill a little gap, which is all I am able to, as you may notice.

First of all I would like to thank the gentlemen of Penticton, in particular, and of British Columbia for their hearty welcome, and I assure you that I am not only anticipating a great deal of useful instruction from the meetings of the convention, but I am heartily looking forward to enjoying some of your pleasure in lake, mountains and fruit. I have rather to apologize for my fellow members of what is known as the Cypress Hills Water Users' Association. I confidently expected several more here, and hope still to hear of that later. Just now, I am the only member present and in apologizing for the other members, I might also state to you that there is some considerable excuse for their absence. Last year, they were feeling in very high fettle, prosperous, and had made up their mind to work together and land this convention for Maple Creek in 1915, but a change has come over their dreams. As explained to the convention last year, the association is in rather different shape to the other irrigated portions of

Main Street, Penticton, B.C.

Canada, as they have to use water from creeks that have an intermittent flow. Last winter, the neighbourhood of the Cypress Hills was almost entirely snowless and this spring it was almost rainless, therefore they have not been able to irrigate in that portion of the country and the territory has dried up, and instead of having an abundance of fodder for stock, they may have to import fodder to keep their stock alive. You will therefore understand that perhaps a number of them do not feel like taking a rather expensive rail and lake journey no matter how much they might regret omitting a visit to Penticton.

In that part of the country, I might say that the efforts of irrigators are devoted almost entirely to growing fodder crops and the stock is fed almost entirely on the farms or ranches of small irrigationists. In coming down yester-

day I did not see much of your beautiful country, but I saw a little, and I might suggest that it would not be a bad thing if some of your fruit growers would devote a little corner to growing a little hay and other fodders, and growing a little more live stock, but as I understand one of the most eloquent speakers from the prairie is going to touch on that, I will not discuss the point further now.

I also represent the Board of Trade at Medicine Hat. It is not an irrigated country at the present time, and the country surrounding it is almost useless without irrigation, but we have a very large project nearing completion and in two or three years we confidently hope there will be all sorts of crops suited to that particular part of the country raised near Medicine Hat. We hope then that Medicine Hat will be seen sufficiently delighted that we will be able to carry the delegates by storm and to welcome you therefore in that city in the not far distant future. I thank you very much for your hearty welcome to the men from the prairies. (Applause.)

CHAIRMAN: As you are all doubtless aware, there is going to be a meeting of the International Irrigation Congress at Calgary this fall, and in connection with the congress there is going to be an exhibition of products of the soil raised by irrigation. We have with us today, Mr. E. L. Richardson, Chairman of the Committee on Exhibits for this exposition and I might incidentally mention that he is also manager of the Calgary Exhibition which, as you are nearly all perhaps aware, is one of the largest fairs on the prairie. Mr. Richardson would like to say a few words to you and point out the importance to British Columbia and doubtless to the Okanagan valley, of being represented with some form of exhibit.

MR. RICHARDSON: Mr. Chairman, ladies and gentlemen,—I am very glad to have an opportunity of extending an invitation to those present to attend the twenty-first International Irrigation Congress to be held at Calgary on October 5 to 9 next, for first time in Canada. At the last congress they voted a change of name from National to International.

In connection with this irrigation congress, one of the special features will be an exhibition not only of irrigated products of the land but non-irrigated products, and the committee have arranged a prize list especially for displays in which over $4,000 will be offered in cash and prizes for district exhibits, starting at $500 for the first prizes, and for some displays, $250, and we are confidently looking to those who are present here to help make this end of the irrigation congress a success.

Another feature of the exhibition is that there will be no charge of admission We expect a very large attendance and there is no charge for space. We will be very glad to have applications from all districts. We are already assured of some from this valley and I am not sure which of the first prizes Penticton has picked out. They are going to make an effort anyway to bring back one of the "firsts," so I trust we will have as many present as possible at Calgary from this gathering. I assure you we will use every endeavour to make it a success and feel confident that you will have as good a time as I am sure the members of this convention will have here. (Applause.)

Grapes grown in the open 4 miles south of Penticton, B.C.

CHAIRMAN: The last address that we will have this morning will be by Mr. Arthur Hooker, Secretary of the International Irrigation Congress to be held in Calgary this fall. He has been connected with the irrigation Congress for a number of years, and will talk on "The Work of the International Irrigation Congress."

MR. HOOKER: Mr. Chairman, members of the Western Canada Irrigation Association, ladies and gentlemen,—As a representative of a great irrigation organization, it is hardly necessary for me to express my appreciation of the invitation extended to me to attend and address this meeting of an important association engaged in this very great work. For a number of years the meetings of the International Irrigation Congress in the United States have been attended by representatives of the irrigation interests of the Dominion, both in official and private capacities. That the interest in the work of the great parent organization on the part of the people of Canada has not been unappreciated is evidenced by the fact that this year, for the first time in its history, the International Irrigation Congress meets without the borders of the United States, its twenty-first annual convention being held in Calgary, in the province of Alberta, October, 5, 6, 7, 8, and 9, 1914.

To my mind the irrigator is perhaps the highest type of worker in that great movement in which we should all be enrolled as workers of the common good, namely, the great movement which has been briefly stated in a popular motto of the Irrigation Congress "Make easy the path of the homebuilder." Surely there can be no greater work than that of making more homes on the land: answering the call of the manless land for the landless man. Particularly at a time like this when great nations are struggling to preserve the family rights of the people does the importance of the homebuilding work of the irrigator stand out in striking prominence.

The International Irrigation Congress was organized at Salt Lake City, September 15, 1891. Like every great movement starting from a small beginning, the work of the Congress has had its ups and downs, its successes and its times of trial. Following the organization in 1891 no meeting was held the next year, in 1892, but the interest in the irrigation continued to grow, and two years later, in 1893, another meeting was held in the city of Los Angeles, California.

At this time it is interesting to note that the second meeting of the organization was called an International Irrigation Congress. However the work of the movement did not progress sufficiently to develop a world-wide organization at that time and the title "International" did not cling to the movement, so that for several years the organization was known as the National Irrigation Congress. At various times the international feature was emphasized through the holding of an international exhibition in connection with the meetings of the congress and through the extension of formal invitations to foreign governments to send representatives to its meetings. In fact, throughout practically the entire life history of the Irrigation Congress, there has been evinced a gratifying interest in its work on behalf of the people of other nations. For several years past there has been a committee of the congress considering the feasibility

of a great international meeting. In this connection it is curious to note that the general idea was that it would be most appropriate to hold it perhaps in Mexico, or some of the southern countries where irrigation is of considerable importance to parts of the nation. The increasing importance of the international feature was emphasized, until at Salt Lake City in 1912 the name of the congress was again changed to "International", and later the invitation to Calgary was accepted for the meeting to be held in that city this fall.

The International Irrigation Congress has been a leader and holder of public thought since that memorable meeting of the little band which assembled for the first time in Salt Lake City in 1891. At that time they were considered visionary, impractical dreamers. Many leaders of the "old-guard" have lived to see the congress dream more than realized.

Irrigating young prune trees by means of deep furrows on each side of the tree rows. (Photographed near Yuba City, California).

The men who have been behind the International Irrigation Congress, and whose efforts have given it the commanding position which it now occupies, are of that kind who believe that the way to do things is to do them. It follows that the history of the congress is a record of achievement,—and what a wonderful record it is! It is doubtful if there are many persons who to-day fully realize the importance of the work started and fostered by the Irrigation Congress.

One hundred, two hundred, or five hundred years from now, history, in looking back over the record of the era, will be able to place a just estimate upon the work accomplished by the forces set in motion through the International Irrigation Congress in its effort to save " the forests, store the floods, reclaim the deserts, make homes on the land."

The Reclamation Act, the Carey Act, and other State and national legislation, particularly in the United States, have accomplished that which was only dreamed of a few short years ago. But it has done more than that which

the enabling clause contemplated. It has placed the seal of government approval upon all reclamation work, and thereby given to it a standing, created a confidence in it, which otherwise never would have been, and this has made it possible to enlist private capital and enterprise to an extent hardly realized, making the irrigation, reclamation and homebuilding movements to-day one of the most remarkable in the world's history.

Benjamin A. Fowler, of Phoenix, Arizona, when president of the organization said;

> "The Irrigation Congress stands for no party, no interest, no clique and no section of the country. It should be the forum where all parties could be heard, all individuals have the same rights, no section monopolizing or controlling the action of the congress, which stands for the whole country, and especially for the irrigation needs of the great arid west. In this organization we know no north, no south, no east, no west. We should not be influenced by the political platforms or policies as against the truest and best interests of the nation as a whole.
>
> "Full discussion of every question should be allowed, not only allowed but invited. There may be sharp differences of opinion and judgment, but they should be the differences of gentlemen where patience, forbearance and universal courtesy are not only the rule but absolutely required and demanded of each speaker. Only by such a policy as this will the Irrigation Congress reach its high ideals, ever achieve the results for which it is aiming, while on the other hand to pursue an opposite course is to invite destruction and decay.
>
> "This should be the constant policy of the congress. We have nothing to cover up or conceal, and on its platform must be 'Equal rights to all and special privileges to none.' "

The general officers of the congress are: President, Major Richard W. Young, of Salt Lake City, Utah; First Vice-President, J. B. Case, of Abilene, Kansas; Second Vice-President, Judge John Fairweather, of Fresno, California; Third Vice-President, S. H. Lea, of Pierre, South Dakota; Fourth Vice-President, Richard F. Burges, of El Paso, Texas; Fifth Vice-President, Kurt Grunwald, of Denver, Colorado. The active management of the affairs of the congress is in the hands of an International Board of Governors, and a Local Board of Control. The members of the Board of Governors are: Chairman, Geo. A. Snow, of Salt Lake City, Utah; Major Richard W. Young, President of the Congress; J. S. Dennis, of Calgary, who is chairman of the Calgary Board of Control; Douglas White, of Los Angeles, California; Lou D. Sweet, of Denver, Colorado; L. Newman, of Great Falls, Montana, and the Secretary of the Congress.

The plans for the meeting at Calgary are in the hands of a Board of Control, with J. S. Dennis, Assistant to the President of the Canadian Pacific Railway, chairman; C. G. K. Nourse, Manager of the Canadian Bank of Commerce, as Vice-Chairman, and Industrial Commissioner, Andrew Miller as Secretary. The Board of Control consists of some seventy representative men of the city of Calgary, and members prominent in government, business, irrigation and agricultural circles throughout the provinces of the Dominion.

Each state and province is entitled to appoint a member upon the International Executive Committee, from which the Board of Governors is chosen, and also to appoint an Honorary Vice-President. It may interest you to know that the member for the Executive Committee from the Dominion is Dr. C. W. Dickson, of Kelowna, and the Honorary Vice-President is Norman S. Rankin, of Calgary, the permanent secretary for the Western Canada Irrigation Association. Since it has been organized, the Irrigation Congress has held meetings in Los Angeles, California; Denver, Colorado; Albuquerque, New Mexico; Phœnix, Arizona; Lincoln, Nebraska; Cheyenne, Wyoming; Missoula, Montana; Chicago, Illinois; Colorado Springs, Colorado; Ogden, Utah; El Paso, Texas; Portland, Oregon; Boise, Idaho; Sacramento, California; Spokane. Washington Pueblo, Colorado; and Salt Lake City, Utah. To this list will shortly be added Calgary, Alberta.

As set forth in its constitution, the objects of the irrigation congress are: First, to promote and diffuse knowledge concerning irrigation and other uses of water; second, to facilitate conference and deliberation among the people of the country concerning irrigation and related interests, and Third: to provide means for bringing the needs of the people of the country before state and federal governments.

The personnel of the congress includes the officers of the Irrigation Congress, the cheif executive of any nation; the vice-chief executive of any nation; the Cabinet members of any nation; members of the highest legislative body of any nation; governors of states and provinces; members of federal, dominion, state, and provincial irrigation, water and conservation commissioners; state and provincial engineers and commissioners of agriculture and horticulture; the mayor of each city or town having a population of over one thousand; executive committeemen; honorary vice-presidents and members of boards of control; chairmen of general and special committees, permanent delegates, and delegates appointed under the provisions of the constitution including fifty delegates appointed by the governor of each state, province or territory; ten delegates appointed by the mayor of each city of more than twenty-five thousand population; five delegates appointed by the mayor of each city of less than twenty-five thousand population and over one thousand; five delegates duly accredited from each commercial body and club concerned with public interests; two delegates appointed by the mayor of each incorporated town having a population of less than one-thousand; two delegates duly accredited by each regularly organized association devoted to irrigation, agriculture, horticulture and engineering; two delegates duly accredited by irrigation or canal company; two delegates duly accredited from each college or university.

To quote from proceedings of past congresses, the harnessing of the floods of our great western rivers, compelling them to turn death to life, desolation to beauty, deserts to gardens, barrenness to fertility, poverty to wealth, and degradation to civilization, was but a few years ago considered a wild fancy. Nevertheless, we ourselves have seen all this accomplished by the pioneer and the United States Reclamation Service. The end is not yet. To quote the late Governor Johnson of Minnesota, "There are still in the West, homes for the

homeless, food for the hungry, work for the unemployed, land for the landless, danger for the brave, an unknown world to conquer, and room for all."

As the construction of the United States reclamation work goes on the need for the existence of this congress is demonstrated and emphasized. No one will deny but for the Irrigation Congress, both the Irrigation Act and the Reclamation Service of the United States would never have been, and the histroy of the arid West would have been very different from what it is today, and yet even the people in the localities in arid America which are most benefited by this law, have to-day little comprehension of this fact. Not many of them realize that the monumental structures of masonry and concrete which the Federal Government is now constructing, destined as they are to play such an important part in contributing to the wealth, happiness and prosperity of the arid West, are all

Testing depth of percolation after irrigation by means of a sharp steel rod 6 feet long. (Photographed near Fair Oaks, California).

the tangible results of the vigorous propoganda which for years before the passing of the National Irrigation Act the Irrigation Congress carried on for irrigation, forestry, and reclamation.

A former president of the Irrigation Congress states, that while the benefits derived from irrigation are often given in measurable terms by acres of land brought under ditches, by bushel or tons of products, and by increased population of arid states, all this, great though it be, fails to express the full measure of the benefit, for the chief gift of irrigation lies in the raising of the standard of excellence. Nor does the tale more than begin with the raising of the standards in products. Even this hardly passes the threshold of irrigation gifts in higher standards. The improvement in methods both demands and inspires larger vision, broader intelligence and a more intensified individuality. Nor does all this measure the gift of irrigation in the highest standards; with irrigation has

developed the highest standards of equity and law, the clearest ethical conceptions, the soundest sense of relative value to be found among men. Consequently, while the area is broad and the acres are many with which irrigation has enriched our country, the other gifts of irrigation are still greater, for it has given us new and better standards, industrial, social, legal, mental, moral, and the perfect apple and luscious peach of the irrigated orchards, admirable as they are in themselves, may fitly be regarded as nothing more than symbols of the more elevated standards of human life traceable, after all, to the real gift of irrigation to humanity.

Among the important questions to be considered by the irrigationists at the present time is that of putting the settler on the land. It is estimated that the once arid sections of the western states now have nine million acres

Carrying the irrigation furrows in semi-circles around the trees. (Photographed near Auburn, California).

under irrigation awaiting settlers. Dr. Samuel Fortier, chief of irrigation investigations in the United States Department of Agriculture, states: "Taking the last irrigation census, the government found that twelve million acres had been provided with water but were not reclaimed for lack of farmers. A portion of this represents farms that have been partly put under cultivation. Making allowance for this, I estimate there are nine million acres now awaiting settlers. It appears to be the greatest problem of the west at the present time. We do not need more irrigation projects. Every effort should now be put forth in bringing in the right kind of settlers in order that the capital invested in irrigation may be rendered secure."

Colonization will be one of the important topics at the Calgary meeting. Our water resources are our most important assets and it is fitting that they should be discussed by such a congress as this and the one to be held in October in Calgary. The problem of the settler on the land will receive attention.

The farmer will have ample opportunity to be heard. The technical side of irrigation, the storing of floods, the measurement of streams, the scientific investigation of irrigation projects, the putting of the water on the land, will be emphasized. The work of the Irrigation Congress for the enactment of more practical and uniform state and national irrigation laws will be continued, and other improvements advocated. One day of the congress will be devoted to a trip free to delegates covering a 160-mile journey to the irrigation block lying to the east of Calgary and a visit of inspection to the Horseshoe Bend dam near Bassano which stores water for the largest individual irrigation project on this continent.

The twenty-first session of the International Irrigation Congress will well repay your attendance, and on behalf of the Calgary Board of Control, and the general officers of the congress, I have the greatest pleasure in extending to you all, and all those interested in the work of irrigation, a most cordial invitation to attend and be a delegate at the meeting in Calgary, October 5 to 9 next. Free discussion is an important feature of the congress and will be encouraged. The Irrigation Congress has accomplished much in the past; there remains more to be accomplished in the future, in carrying out its plans to "save the forests, store the floods, reclaim the deserts, make homes on the land." (Applause.)

CHAIRMAN: Mr. McCoy, the President of the Aquatic Club, and manager of the local branch of the Bank of Hamilton and, incidentally, according to the words of His Worship the Reeve, the future president of the bank, has an announcement to make.

MR. MCCOY: Ladies and gentlemen,—On behalf of the directors of the Aquatic Club, I have great pleasure in extending to you a warm invitation to avail yourselves of the advantages of the club-house during your visit to Penticton. It is situated on the lake front, almost opposite the Incola Hotel. We are holding our annual regatta on Tuesday afternoon, commencing at two o'clock sharp. In the evening the prizes will be presented and, following that, there will be a purely informal dance. An orchestra will be in attendance and we hope the ladies who have accompanied the delegates will be with us.

CHAIRMAN: The secretary has a few expressions of regret to read, and has also an announcement to make.

SECRETARY: I have some letters of regret and some war bulletins, and in order that you may stay, I will read the letters first and the war bulletins afterwards.

The following letters were then read:—

VICTORIA, July 17, 1914.

EDGAR V. DYNES, Esq.,
Secretary, Penticton Board of Trade,
Penticton, B.C.

DEAR MR. DYNES,—I am obliged for your invitation on behalf of the local committee to attend the convention of the Western Canada Irrigation

Association. I can assure you that it was not through any lack of interest that I have not been able to attend any meetings of the Association, but you can well understand that my many public engagements frequently prevent me from taking advantage of such opportunities as you offer.

If at all possible I shall attend on the 17th of August, but I am quite unable to give you any definite idea at the present time.

With very best wishes,

I am, yours sincerely,

RICHARD MCBRIDE.

(*Telegram*)

VICTORIA, B.C., August 16, 1914

NORMAN S. RANKIN, Esq.,
Secretary, Western Canada Irrign. Assn.,
Penticton, B.C.

Please extend to officers and members present my regrets my inability be present at this session. Have several urgent engagements during next few days which are unavoidable. Please express my warmest hope that present session may be most successfully held and that work performed may be most beneficial to all the interests involved.

W. R. ROSS,
Minister of Lands.

CALGARY, August 14, 1914.

NORMAN S. RANKIN, Esq.,
Calgary, Alta.

DEAR SIR,—I am writing to express my extreme regret at not being able to be present at the eighth annual convention of the Western Canada Irrigation Association, to be held in Penticton on the 17th, 18th, and 19th of this month.

Up to a few weeks ago, I had fully intended to be present, but a number of emergent circumstances arising out of the present unforeseen war conditions, prohibit my making the trip.

The work that the Western Canada Irrigation Association has been doing for a number of years is of great value to the irrigation interests of Western Canada, and one that every agricultural community should support, and I am hopeful that this present convention, although held under very trying and distressing circumstances, will prove to be a fruitful and helpful one. It is, of course, recognized that, notwithstanding the war and its terrible results, agricultural and irrigation interests must of necessity be carefully looked after; in fact, more earnestly at the present moment than ever before—for the country must live—and we must therefore help the farmer, both as an individual and as a community in all possible ways.

Again expressing sincere regrets at my inability to be present, and with all kind wishes for the success of the convention, believe me to be,

Yours very truly,

J. S. DENNIS,
Assistant to the President.

LETHBRIDGE, Alta., August 14, 1914.

DEAR MR. RANKIN,—I had been promising myself the pleasure and instruction to be gathered from attending your convention, but some business has arisen that requires my preseence in Lethbridge just at this juncture.

I hope you will have a very successful time.

Yours sincerely,

G. A. MARNOCH,
President, Board of Trade.

CALGARY, August 14, 1914,
Active Service Assembly Quarters,
4th Field Troop, C.E.

The Secretary, W.C.I.A.

DEAR MR. RANKIN,—I much regret to say that under the present conditions my duties as an officer of the Active Militia of Canada will make it impossible for me to attend the convention at Penticton.

On account of my very great interest in irrigation matters and my anticipation of meeting so many old friends at Penticton, I had been looking forward to the convention with a great deal of pleasure, but my military duties are imperative.

Please express my great regret to the president and delegates at the convention and wishing you a very successful meeting,

Yours very truly,

F. H. PETERS.

SILVER LAKE, Utah, July 26, 1914.

DEAR MR. RANKIN,—I can only repeat what I wrote to Mr. Dennis, that I cannot now see my way clear to visit Canada during the Penticton congress—which I regret exceedingly.

Success to you, with anticipations of meeting you personally and of acquiring a wider acquaintanceship in your splendid province, I am

Yours respectfully,

RICHARD W. YOUNG.

(*Telegram*)

CALGARY, Alta., August 17, 1914.

NORMAN S. RANKIN,
Penticton, B.C.

Regret through illness unable to attend convention. Wish every success.

A. E. CROSS.

REGINA, July 16, 1914.

J. S. DENNIS, Esq.,
Chairman, Executive Committee, W.C.I.A.,
Calgary, Alta.

DEAR MR. DENNIS,—I am in receipt of your favour of the 9th instant and have to thank you for your very cordial invitation to be present at your Annual Irrigation Convention to be held at Penticton from August 17 to 19.

Replying, I may say that I have been so laid up with an attack of sciatica that I feel I would not be warranted in making any further engagements until my indisposition is removed.

I would like to be present at your convention but, in view of the circumstances above referred to, I scarcely think it possible that I will be able to be with you.

Regretting this, and trusting that your convention may be a successful and profitable one, I remain,

Yours very truly,

W. R. MOTHERWELL,
Minister of Agriculture.

THE "TIMBERMAN,"
PORTLAND, Oregon, July 18, 1914.

MY DEAR RANKIN,—I want to thank you for your favour of July 17 inviting me to be present at your association meeting which will hold its eighth annual convention August 17, 18, and 19. I would have been glad to have been with you, but I am in the throes of our Logging Congress, which will hold its sixth annual session at Bellingham, Wash., August 27, 28, and 29.

All I can say is, "God bless you and God-speed." I shall make a note in this issue of the *Timberman* of your convention.

With my best wishes, I ever am

Yours very truly,

G. M. CORNWALL,
Publisher.

MAPLE CREEK, Sask., August 15, 1914.

NORMAN S. RANKIN, Esq.,
Penticton, B.C.

DEAR SIR, AND GENTLEMEN,—I regret very much that I cannot be with you, but circumstances which I have no control over prevent me from being present. I take this opportunity of drawing your attention to the fact that this season has brought it more convincingly to our notice that we require storage reservoirs, as there was a large quantity of water in our creeks in the early spring, but when required had run to waste, and therefore we had no crops, as we had no rain anywhere. Where there was a little water to be had, there was added proof that it paid to irrigate.

Wishing you every success, I remain

Yours very sincerely,

R. G. WILLIAMSON,
President, Cypress Hills Water Users' Association.

FORESTRY BRANCH, OTTAWA, August 13, 1914.

The Secreatry,
Western Canada I.A.,
Penticton, B.C.

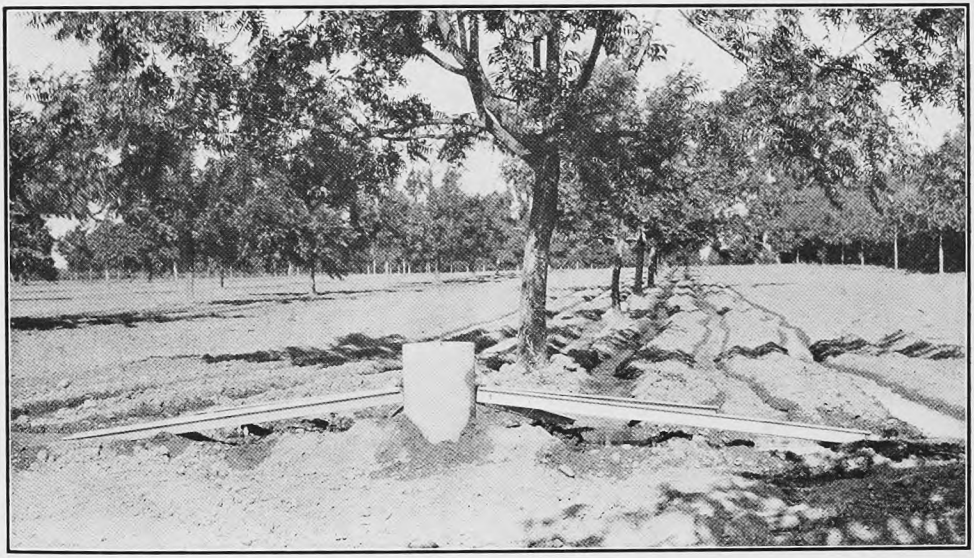
SIR,—In the absence of Mr. Campbell I beg to acknowledge receipt of your post card announcement of the Irrigation Convention to be held on August 17, 18, and 19. As Mr. Campbell is in Europe at the present time, it will not be possible for him to attend the convention.

Your obedient servant,

T. W. DWIGHT,
For Director.

The Secretary then read the first of a series of war bulletins, the despatch of which he had arranged for daily direct to the convention from Calgary, and these were much appreciated during the course of the sessions.

CHAIRMAN: This concludes our morning programme, with the exception that we have to appoint two committees, one to deal with resolutions, and the other with credentials. As a Committee on Credentials, I will appoint Messrs E. Foley-Bennett, Penticton; W. J. Lloyd, Lethbridge; and R. C. Pegler Bassano; Mr. Foley-Bennett being chairman.



Irrigating a walnut orchard by furrows with water delivered through underground concrete pipes and galvanized iron troughs. (Photographed near San Jose, California).

As a Committee on Resolutions, I will appoint Messrs. William Pearce, Calgary; C. W. Dickson, Kelowna, Walter Huckvale, Medicine Hat; A. Chamberlain, Kamloops; and H. C. Dufresne, Penticton; Mr. Pearce being chairman.

The Committee on Resolutions will meet for a moment immediately after the session in the room to the right.

The convention is now adjourned until two o'clock this afternoon.

AFTERNOON SESSION, AUGUST 17, 1914, 2 p.m.

CHAIRMAN: The meeting will please come to order. As in the past in our previous conventions, we wish to have as much discussion from the floor as possible. After each paper, as much time as possible will be left for discussion. We have certain rules regarding that in our constitution, and I will ask the local secretary, Mr. Dynes, to read the more important ones.

Mr. Dynes then read section 4 and 8 of the constitution.

CHAIRMAN: The secretary is just in receipt of a letter from Mr. Drake, Superintendent of Irrigation for the Dominion. This is written from Medicine Hat.

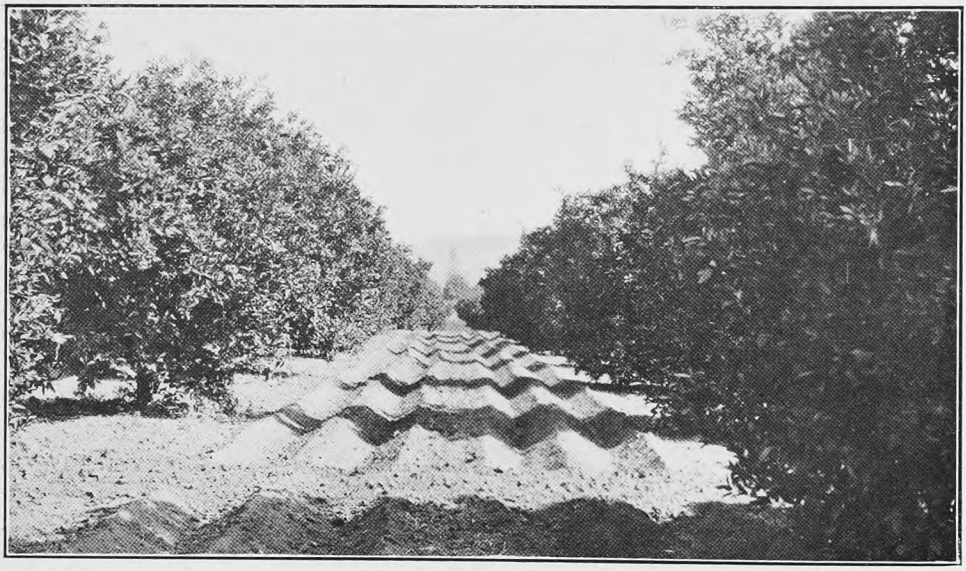
The permanent secretary then read the following letter:

MEDICINE HAT, August 14, 1914.

DEAR MR. RANKIN,—I very much regret that urgent business prevents me from attending the convention this year. I know that a number of others who had planned attending have been similarly prevented, but I trust that there will be a good attendance notwithstanding and that the convention may be at least as useful and interesting as in previous years.

Sincerely,

E. F. DRAKE,
Supt. of Irrigation.



Orange orchard prepared for irrigation by means of 4 deep furrows. (Photographed near Glendora, California).

CHAIRMAN: The chairman of the Committee on Resolutions has asked me to request that if any other delegates wish to present resolutions, they should be handed in at once. I also announce a meeting of the Committee on Resolutions immediately following the adjournment of the general meeting.

The first paper this afternoon will be an address by Mr. S. G. Porter, of the Department of the Interior, Calgary, Alberta, on the following subject:

THE PRACTICAL OPERATION OF IRRIGATION WORKS.

Mr. S. G. PORTER: Mr. Chairman, ladies and gentlemen,—It is my desire in this brief discussion to bring out a few points of practical value to those interested in irrigation as an everyday bread-and-butter affair. As the title implies, I shall confine myself to practical matters, and not indulge in theories. I do not even expect to be able to say anything that is new to those who have seriously studied or practised irrigation. I therefore find myself hampered with the obvious difficulty of presenting thoughts which you may well consider trite and threadbare. But after all, a review of some of the facts which are familiar but which may have been neglected, or have failed to impress us with their importance, may be helpful. I trust that it will be so in this case,

There are naturally two points of view for the consideration of this subject: that of the manager of the irrigation system, and that of the water user or irrigation farmer. Each has problems peculiar to itself, and yet their interests are so nearly identical that the success of the one is essential to the well-being of the other. It must be remembered by the management that the operation of the canal is not an end in itself, but is solely for the benefit of the users. To so operate the canal that the farmers will reap the greatest possible benefits from the use of the water is the main purpose of the management. In so doing it will likewise best serve itself. There are certain well-known qualities which the man in charge of the operation of a canal should possess, such as business ability, tact, a practical knowledge of irrigation and agriculture, an ability and readiness to appreciate the farmer's point of view and his difficulties, a knowledge of human nature, fairness and firmness in administering his duties. The exercise of these qualities will determine his success, whether he is a ditch rider, distributing water from a lateral, or is the superintendent or manager of a big system. A high standard is required, and unless it is maintained, troubles will multiply.

Of the problems which must be met in the operation of irrigation canals, those involving the human element are far more difficult than the physical ones. The people under the canal are of every religious belief and political following. There is no uniformity in ideals or in habits of thought. In all honesty and sincerity, therefore, they misunderstand and are misunderstood. Often the seeds of future misunderstanding are sown by the agent who induces them to buy irrigated land by painting entirely too optimistic a picture in which the rich returns are magnified and the labour necessary to secure them is minimized. Disappointment follows disillusionment; and the disappointed man is always a hard man to deal with. Thus the human or social problem is a complex one.

These conditions, while they make more difficult, do not lessen the importance of co-operation between the management and the users. Co-operation must be obtained, or the result is suicidal. And it can only be obtained through the exercise of good sense and fairness on both sides. The company which attempts to enforce arbitrary, imperialistic methods without due consideration of the varied difficulties which the irrigator must meet, will not receive, nor will it merit, the helpful co-operation of the water users. It is necessary to have rules and restrictions, and the larger the system the greater the necessity, but such a schedule must be so flexible that it is the servant and not the master of the management.

Watering the spaces in the tree rows by off-sets in the furrows nearest the rows. (Photographed near San Dimas, California).

On the other hand, the farmer who does not recognize the rights of his neighbours as being of equal weight with his own, and who always expects the company to grant him some special concession which it cannot consistently extend to all, is a hindrance to harmonious co-operation. A recognition of the rights of others is the fundamental basis of co-operation in irrigation, just as it is in citizenship. Neither business nor government can succeed without it. It is absolutely necessary to exercise authority in both cases. In its exercise, fairness must prevail. Yet the very competency which comes through fairness and firmness invites antagonism from those who are selfishly inclined. It is as much the duty of the users of irrigation water to recognize fairness and abide by rightfully exercised authority as it is of the management to administer it. The obligations are mutual.

Many irrigation systems are operated by the water users themselves. This has many advantages and should be the ultimate aim of all systems where the conditions for its establishment are favourable. It is impossible to inaugurate it during the early stages of the development of a project before the land is

fully settled and the water users have become somewhat acquainted with the problems of operation and the distribution of water. And then there nearly always follows a period of near chaos until the water users become educated or accustomed to the exercise of their newly acquired authority and have fought out among themselves their own various theories of management and have settled down to a recognition of the necessity of a central authority which shall be dependent upon, but, at the same time, superior to individual and local wishes. But after it has passed this stage of its history, the water users, as stockholders in their mutual company, will be better contented to abide by the authority which they have a voice in constituting. The responsibility of management has been shifted from a corporation to themselves, and with it the criticism and friction which prevent harmony. Grievances and dissatisfaction are inseparable from water distribution, but they are easier of adjustment between mutual users than between the users and a corporation.

This is not necessarily because corporation management is less fair or less efficient than management by the users themselves. Usually the reverse is true. But a prejudice exists in the minds of the people against big companies and corporations, and this makes it difficult to adjust the differences that arise. In nothing is the spirit of neighbourliness more needful than in the division of water, and there is no severer test of neighbourliness than the ability to agree on its division.

Co-operative systems are better adapted to small canals than large ones. On the small ones the interests are less varied, all the users are acquainted with each others needs, and the community spirit prevails. As the size of the project grows and the property interests to be protected increase and become more varied, the difficulties also increase. Jealousies between districts militate against efficiency and fair treatment. The matter of repairs can no longer be handled as a neighbourhood affair by the farmers themselves. The maintenance of a big system must be on a thoroughly organized business basis. The men in charge must know what to do and be prepared to do it quickly. Accidents are serious. They cannot be prevented altogether, but a well-organized staff under a strong central authority can reduce their dangers to a minimum. Since these things can usually be better achieved by a company than by an organization of farmers, it is doubtful if co-operative management is to be endorsed for large systems.

It is difficult to find a middle ground between corporation control and mutual control. A division of responsibility necessitates a division of authority, which inevitably leads to conflict. It is for this reason that water users' associations are so often disappointing. They have their place, and may be very useful and even necessary for promoting the interests of their members. But too often instead of giving their attention to problems of bettering their own conditions they cultivate an antagonism with the management, creating rather than reducing friction. This fault usually arises out of the ambition of certain self-appointed leaders to acquire for themselves greater power. It is not usually the direct fault of the farmers themselves, but grows out of their permitting the local politicians and men known for their much talking to gain control of their organization and working for their own selfish interests instead of the greatest

good of the community. The result is that the farmers are made to believe that the management is opposed to their interests, and they drift into an attitude of opposition which works harm both on themselves and on the management. Thus their organization, instead of being a medium through which their honest wishes and interests find expression and which gives strength to their demands upon which the management can act with the assurance of best serving the community, becomes a source of trouble and immensely increases and complicates the difficulties of operation and management. Sometimes the main canals are operated by the company, while the laterals and distribution system are operated by the farmers. In this case, the farmers under a lateral incorporate a stock company for its control, and the authority and responsibility of the company operating the main system ends when the water is delivered at the headgate of the lateral. This system has the advantage of giving the users a voice in the distribution of their water, and in educating them in the problems attending operation. It has been successful under proper conditions, but is not likely to succeed unless the land is farmed by its owners who are interested beyond one season's crops. Otherwise, maintenance will be neglected and even the operation will be indifferently administered. The modern tendency is towards retaining in a central organization, whether it be a corporation or a co-operative company, the control of the water distribution to the individual farm units. In this way, trained men, properly organized, look after the details of distribution, more consistent methods are followed, and the work accomplished with greater efficiency. Furthermore, it is in line with the modern idea of specializing in the division of labour, permitting the farmer to give his entire attention to irrigating without being burdened with the care of ditches outside his own farm.

Rotation of delivery is now practised almost everywhere in preference to the constant-flow method. The constant-flow method, where the irrigator always has the water at his command, is well adapted to large holdings, but even then it is of necessity rotated from one part of the holding to another and is not different essentially from rotation among small individual holdings. A small stream flowing constantly cannot be economically used. It is necessary to have a sufficient irrigation head to cover the ground quickly. Otherwise it will spread so slowly that the land near the ditch will receive too much, and that further away, not enough. Uniform distribution under such circumstances is impossible. Furthermore, it leaves no opportunity for proper cultivation between waterings.

One of the weaknesses of general irrigation practice has been the lack of proper records. So long as the supply was large enough to give everyone all he wanted and at the time he wanted it, there was no particular need for records. But in most districts, that time has passed. Proper measurements and records are a necessary part of a well-developed system of operation. They are the best answers in disputes over questions of equitable distribution. They are the best check on economy of use and prevention of waste. They are the only means of determining scientifically the proper duty of water and for securing the highest efficiency in its application. The irrigation management which, for the sake of economy, tries to get along without keeping records is practising the same kind

of economy as the merchant who tries to run his business without keeping books. Neither is able to tell whether he is expending his capital wisely.

For purposes of comparison, and for arriving at recognized standards, uniformity of methods of operation, records and reports among irrigation enterprises would be immensely useful. Irrigation practice in this country is yet in its pioneer stage, and has not crystallized into customs and standards.

Terrace irrigation with water distributed in furrows. (Photographed near Highgrove, California).

Much has been done in this direction in the past few years by the United States Reclamation Service, but the co-operation of private as well as government enterprises is needed.

The operation of irrigation works is concerned, not merely in carrying water through canals and delivering it to the farmers, but also in its proper application. It is no small part of the duty of the operation organization to study the needs of the soil and of the crops grown, and to give scientific instruction and assistance to the farmers it serves.

It is likewise the part of wisdom on the farmer's part to avail himself of every opportunity to improve his methods in the application of water and the care of his crops. It is along this line that I wish to appeal to the farmer members of this convention.

I wish every one of you would read the results of Don Bark's work in Idaho. He deserves the thanks of every irrigationist on the continent. He has shown very forcibly and in a very practical way, the effects from different methods of watering. One of the strong points is the bad effect of using too much water. It not only means a waste of water, but a positive injury to both the crop and the soil. Excessive waste is often accomplished by trying to run the water across the field too far. It is not uncommon to see a farmer trying to spread water across a 40-acre field from one head ditch. In doing so he gives the upper

part of his field three or four times as much water as it requires before the water reaches the lower side. It is obvious that the waste is immense. I show here a diagram from one of my own reports on water distribution under one of the large canals of Colorado. The results shown are based partially on careful estimates, taking into consideration average conditions. The case is not exaggerated. You will note that the water efficiency of the system is only 28 per cent. That would certainly be deemed a very poor showing in any other business; in fact it is a poor showing in irrigation, but, as I said, it is not uncommon.

Let us take this as a typical case and analyse it. The main canal has a carrying capacity of 800 second-feet, and is 80 miles long. It is fairly well built and has been in operation about twenty years. The soil is fairly heavy

Young orchard set out and being irrigated on contours. (Photographed near Riverside, California).

sandy loam. You will note that the loss in the main canal is 25 per cent. While its total length is 80 miles, its length from the intake to the centre of distribution is 50 miles. The losses therefore average one-half of 1 per cent per mile. The loss in the distributaries between the main canal and the farmers' deliveries amounts to 25 per cent of the amount delivered to the laterals, or to 19 per cent of the total taken into the main canal.

These losses, which are common to all canals built in ordinary earth, can be reduced to a negligible quantity, when the value of the water reaches the point where it will justify lining the canals or piping the water. This condition exists only in a small proportion of cases.

The next losses shown are the ones I want to call to the special attention of the irrigators present. These are the field losses, and are divided into three kinds: surface, run-off, field evaporation and deep percolation.

The field surface run-off is largely under the control of the irrigator. Its amount depends upon the skill of the irrigator, the preparation of the field

ditches and the land, and the method of handling the water. It is of great importance to locate and construct the farm ditches in a manner suited to the topography, the soil, and the crop grown. And it is of equal importance to have the ground properly levelled and prepared. The average loss by surface run-off amounts to not less than 10 per cent of the water delivered to the farm.

Field evaporation amounts to an average of 20 per cent of the water delivered to the farm. It can be materially reduced by using deep furrows or by properly tilling the soil after the application of water.

An additional 20 per cent of the amount delivered to the farm is usually lost by deep percolation beyond the reach of plant roots. This loss may be immensely more on sandy or gravelly soils, where the water is spread a long distance between cross ditches. In clay soils, or in short runs, it will be less. This loss can be largely controlled by regulating the size of the irrigating head and the length of the run. Probably three-quarters of it can be avoided by adopting scientific principles of irrigation.

These three field losses, then, under conditions that ordinarily prevail amount to 50 per cent of the water delivered to the farm, or to 28 per cent of the amount taken into the main canal leaving only 28 per cent to be utilized for plant growth. In other words, an average of less than one-third of the water diverted from the streams is utilized for plant nourishment. The rest is wasted in one way or another.

I wish to emphasize one other point in the application of water, that is the importance of applying it at the right time. This is illustrated by the second chart which shows the results from four fields of wheat which came under the observations of an official of the Department of the Interior in the Duty of Water Investigations, near Lethbridge, last year.

The fields are near each other, and the conditions, other than the application of water, were similar. In the upper part of the diagram, the daily rainfall is shown to scale. It will be noted that from the 13th of May to the 19th of June, a period of five weeks, there was almost no rainfall. Field No. 1 was irrigated the first week in June, before it began to suffer from the drought, and it yielded 31 bushels per acre. Field No. 2 waited ten days longer and yielded 26 bushels. Field No. 3 was not irrigated until the 17th of June, or just at the time the rains began. It yielded 19 bushels. Field No. 4 was not irrigated at all, and produced 15 bushels.

In a climate with a short growing season, it is important that crops be urged along and not permitted to have a setback and then be given a second growth. Such conditions will not only reduce the yield but are likely to prolong the growth too late for it to reach maturity. The illustration shows that field No. 1 irrigated at the proper time, not only produced more than double the yield, but matured just as early as the non-irrigated field, while those which were irrigated later, matured later and yielded less than the first.

Success in irrigation depends upon getting water at the right time, in the proper amount, and applying it in the proper way. Not to meet these conditions will mean a loss anywhere from a few dollars to perhaps a hundred dollars per acre in crop returns. The responsibility then is heavy on both sides, on the

operator and on the irrigator. It emphasizes the necessity of proper maintenance and able management on the part of the company as well as the use of scientific methods on the part of the farmer.

I am a strong believer in getting things down to a practical basis and have emphasized the practical side of this question as opposed to the technical or theoretical. But the word "practical" stands like a Chinese wall around some men, keeping out the benefits of adopting anything recommended by the scientist. Being practical, as they understand it, is doing things in the same good old way their grandfather did. A man with that conception of what is practical is most likely in these days to be a practical failure.

Irrigating an orchard with 3 contour furrows between each tree row. (Photographed near Porterville, California).

Someone has said "the hardest man to teach farming to is the farmer." So the hardest man to teach irrigation to is the irrigator. That is, the old irrigator, set in his ways—wrong ways—and unwilling to change them for newer, more scientific ones. Irrigation farming is a business, it is also a science. And it should profit by the methods of both the business man and the scientist. Don't let the exaggerated idea of your own practical methods stand in the way of your adopted better ones. They are not necessarily less practical because they are more scientific.

Don't depend for success entirely on hard work. Important as it is, it is a costly substitute for modern scientific methods. Proper methods are just as essential for success in your work as in the modern manufacturing plant.

The wise man profits not only by his own experience, but also by the experience of others. Your own experience is, of course, the most important. You should make it a matter of record for analysis and comparison, so that you will not continue to make the same mistakes over and over. That is what finally brings failure. But the new man need not be discouraged. He can go far with-

out personal experience if he knows how to utilize the experience of others. It is said that not more than 2 per cent of the farmers of the country take practical advantage of advanced scientific methods of soil and crop culture described and advocated in government bulletins and experimental station reports, distributed free by the Canadian and United States Governments.

My appeal to you is to avail yourselves of the assistance that is offered for improving your conditions and increasing your returns. (Applause.)

CHAIRMAN: If there is no discussion, we will proceed to the next address on the programme. I may say that on account of several not being able to be present, the three addresses given in the printed programme have to be changed. We expect, however, that the absentees will be present tomorrow.

We will now listen to Mr. C. L. Smith, Agriculturist with the O.W.R. & N. Company, Portland, Oregon, his subject being

LIVE STOCK AND MIXED FARMING.

Mr. C. L. SMITH: Mr. Chairman, ladies and gentlemen,—What I have to say on the subject of diversified farming in this paper, has reference to the man who lives on the land, who is striving to provide a home and home comforts for himself and family through the application of his labour and the intelligence use of his land.

For more than forty years I have been a student of farm life, and I have had exceptional opportunities for observation and investigation under varying conditions. I am familiar with all the struggles, hardships, and deprivations of pioneer life; not alone from observation and investigation, but from personal experience. The lack of adequate working capital, bad market conditions, drouths, storms, insect pests, frosts too late in the spring or too early in the fall, and yet in spite of all the handicaps, I hold this fact as absolutely true; that the individual who desires to make for himself and family a home with home comforts, who must provide these things by the labour of hand and heart, can secure a larger measure of the necessities and comforts of life in the care and cultivation of a small farm, than a like amount of thought and labour will secure anywhere else.

Compared with the life of a wage-earner in the city, the opportunities and advantages of the small farmer are in every way preferable. The same amount of labour will provide a much better house, better food, with better air and more agreeable surroundings. He does not have to obey the orders of the boss, nor the rules of the union. He is not afraid of losing his job. His eggs are fresh, his milk unskimmed, his fruit and vegetables are fresh from the tree or vine. He is not ambitious for wealth, does not venture into some schemes to get rich quickly. He can be independent of business conditions, financial crises, or other factors that vex the average wage-earner.

An important factor, contributing to success anywhere, east or west, north or south, on the irrigated tract, the dry farm, or in districts with abundant rainfall, is the dairy cow, which ranks first, with the pig and the hen as valuable allies.

Deputy Minister of Agriculture, W. E. Scott, wearing the "smile that won't come off".

In the first address I ever made before a Farmers Institute, over thirty years ago, I argued for a diversified system of agriculture; this for the reason that my experience and observations had emphasized the fact that where a diversified system of farming was carried on with the cow, the pig, the hen, and the garden as important factors, I found better homes, better home conditions, better food on the table, better, healthier, happier families, less debts, and less fault finding with conditions.

One of the conclusions formed from a careful study of conditions, and a study of results, is that the owner of a small farm, who places home making ahead of mere money making, is nearly always successful, while the man who is striving always for money, that is concentrating thought and energy only on the production of something that is to be exchanged for cash, is in most instances a failure.

By "diversified farming" I do not mean a haphazard scattering of resources, effort, and opportunities; the system of farming to be followed must depend upon a great variety of factors, and the measure of success achieved will always be modified by the adaption of these factors to each other, the taste, the energy, the ability of the individual. As a rule, the largest measure of success will be secured where there is some one thing selected as a leader, with such diversity along other lines as to cause continuous labour, with fairly continuous income. The selection of a crop leader must be determined by the taste of the individual, the distance from the market, the character of the soil, the labour available, working capital, and whether or not the land is irrigated.

The waste of time, energy, opportunity, and resources through negligence, carelessness, and ignorance is appalling. This is especially true of localities where land is cheap and scarcity of labour obtains. It is a well recognized fact that where such conditions exist, every one wants to sell out. I am often asked: "What can we do to attract settlers and capital." My answer is: "Make better use of your resources, do better farming, get more live stock, give them better care, clean up your door yards, farm less land, bur farm it better."

Those who have studied the problems of developing the magnificent resources of the Pacific Northwest, realize that the development of these resources depend primarily upon the man on the land. It is more important that he should succeed, that he should intelligently utilize his labour, his land, and his capital, than it is to get more men here. If those already on the land make good, others will come.

I am employed by the Oregon, Washington Railroad and Navigation Company to devote my time and energy to the improvement of conditions among the farmers in the country served by the railway lines. I am frequently asked the question: "Why is the railway interested in improving the condition of the farmers"

The traffic managers of our large transportation companies have long realized that any section of the country devoted to a single crop system in farming, has an unreliable and unsatisfactory source of revenue. Statistics prepared by them demonstrate that the largest volume of business comes from districts where a diversified system of farming is carried on, and that this business is more equally divided through the year, and can therefore be carried on more economically and satisfactorily. It is also a recognized fact that only a small percentage

of the productive capacity of any given section has yet been fully developed. Any increase of business must necessarily come from the development of these latent resources, and that is where the railway comes in.

There are three directions to which we may look for future development: First, the clearing and bringing under cultivation of logged-off lands; second, the increase of irrigated areas by the use of storage reservoirs and pumping plants; third, and most important is the breaking up of large holdings, already under cultivation in large farms, into smaller farms. This necessarily means more people on the land, more profitable and continuous employment of labour, more intensive methods of cultivation, more and better live stock, more business for the merchant, the banker, the manufacturer, and the transportation companies.

I visit the farmers in their homes, study their methods, compare results, make suggestions for improvements, encourage the interest in live stock, and urge a greater diversity of crops and a more intensive cultivation of the soil. A few years ago, in the irrigated valleys, there were just two lines of production, alfalfa and apples; and in the dry farming section, wheat on summer-fallow land. We inaugurated a campaign for diversified farming, ran demonstration trains, delivered lectures, distributed literature, held farmers' meetings in the school-houses, distributed seed, visited the farmers on their farms, and induced them to try experiments. The results have been very gratifying. The people along our lines are raising even more wheat and more apples, and have added thereto hogs and cattle, butter and eggs. They are growing corn to balance alfalfa in dairying and beef-making, building silos, growing peas, corn and other crops instead of bare summer-fallow.

One of the largest alfalfa growers in the Yakima valley last year ploughed up 50 acres of old alfalfa land and raised 4,000 bushels of corn. Another man ploughed up 3 acres of alfalfa, covered the sod with cow manure, and raised 100 tons of corn silage on the 3 acres. He raised the entire feed for a herd of 25 cows on 20 acres of irrigated land, and sells $3,000 worth of cream a year.

In one irrigated district they have 1,400 acres of corn and 800 acres of field peas growing between the rows of young apple trees. All this will be fed to the hogs and cattle, and the manure returned to the orchards. In the Hood River district they are building a co-operative creamery. In every irrigated district reached by our lines, the acreage of corn, the number of cows, of silos, of pigs, and of poultry is steadily increasing.

At the recent irrigation congress in Denver, the danger and disadvantage of a single crop system was well illustrated by one of the speakers, who said: "In our districts the units are 160 acres and acting under the advice of experts, we have seeded the whole to alfalfa. We have three years crop on hand, there is no market for hay—we have no cattle to eat it—we are behind in our payments —we have no title to our land—we cannot borrow money to buy live stock—the Government will have to come to our assistance or we will have to abandon our claims." He closed with an eloquent plea for a system of rural credits. In the discussion that followed, I pointed out the mistake of a single-crop system, and closed with the statement that I had always found the best pioneers on any project of this kind were the cow, the pig, and the hen, and that together

or seperate they would beat any loan company on the face of the earth, no matter how low the rate of interest.

On the question of fertilization, which is conceded to be one of the most important confronting the irrigator of the present day, I would say that the maintenance of the necessary amount of plant food in the soil is one of the necessary factors in the production of choice fruit, vegetables, grains, or forage crops. The largest percentage of profit is unfairly secured by the method that secures the best quality and the largest yields. The history of agriculture for hundreds of years indicates that the most satisfactory, the most lasting, and the most reliable method of maintaining or increasing the fertility of the soil is to make live stock in some form or other an important factor in the system—to produce an abundance of forage to be fed to such stock on the farm—not sold, and to intelligently apply the manure from the herd to the land. We have also learned that as soon as stable manure is made it should be mixed with the soil to secure the best results. It is also a well-recognized fact that certain crops take different elements from the soil, and that many of them leave elements in the soil that are poisonous to themselves, but food for other plants. Therefore crop rotation has a tendency to improve the yield and quality.

Nearly all the soils in the irrigated areas are deficient in organic matter. The addition of this organic matter increases the amount of available plant food. The moisture-holding capacity of the soil and the facilities of irrigation are dependent on each other. The best known method of increasing organic matter in the soil is by the application of stable manure. Next to this is the use of cover crops; but the poor man who depends upon his land and labour to provide himself with the necessaries of life, cannot afford to grow cover crops to plow under. He can afford to grow clover, peas, rye, vetch, and corn, however, and feed them to cows, calves, and pigs, and put the manure back into the soil.

One of the reasons why a diversified system of farming is made advantageous for the man who does his own work, is the fact that it more equitably divides the labour throughout the year. As an illustration: In a meeting of one of the big irrigation projects where many of the members only held 10 acres, I urged them never to plant more than one-half their tract with one crop, to grow at least an acre of corn, to keep at least one cow, one hundred to two hundred hens, and a good brood sow, and to arrange a system of cropping that would divide the labour over the entire season. One of the crops discussed was onions, a crop requiring much hand labour in May and June, and giving gross returns of from three to eight hundred dollars per acre. When discussing the cow proposition one young man asked:

"For how much could you buy the feed to sustain one cow for one year?" My answer was about $75.

"How much ground would it take to grow that much feed on?" he then asked. I replied, "About an acre."

"Then why not plant the land to onions and buy the cow feed?" said the young man.

I said: "Because you would not do it. One acre of onions is the most a man should grow, or attempt to grow, unless he expects to hire help."

Another advantage of diversity in farming is found in the fact that in some seasons certain crops will prove a partial or total failure. This is particularly true of certain perishable crops like onions and potatoes, which some seasons do not realize sufficient money to pay for marketing. The man who has only potatoes and onions that year is in hard luck. In this connection I want to say, that when I find a man anywhere who has a given acreage of potatoes every year, and stays with it year after year, he is always well to the good for a term of five to ten years.

On the other hand the producer who grows more of any perishable product than is sufficient to supply the immediate local demand will always be at a disadvantage in marketing that product unless he has enough to ship in carload lots, or can combine with others in the same locality to make up carload shipments. This emphasizes the necessity of local organizations and co-operation. The measure of success among producers in any locality with any line of produce is usually determined by the character of their local co-operative organizations. Such organizations can with reasonable accuracy determine some special crop for which the soil and climate in that particular locality is peculiarly adapted. By making that crop a leader, standardizing the product, establishing a reputation, adopting uniform grades and packages, a market can be found twenty-five to fifty per cent better than the average individual would be able to get. Even then the most successful are those who diversify. The most successful raspberry grower at Pullyap, Washington, where raspberries are the leader, keeps a dairy of twenty-five cows, has an acre of rhubarb, keeps a large flock of poultry, and has less than one-third of his land planted to raspberries.

An intelligent diversity not only tends to provide continuous and profitable employment, it provides something of interest to different members of the family. Give the boys something to do that is interesting and profitable and you have gone far toward the solution of the problem of keeping them on the farm. (Applause.)

CHAIRMAN: Now we are surely going to have a discussion.

MR. JAMES JOHNSTONE: I should like to ask Mr. Smith some questions because I believe every word he has said, having practised for nine years everything he has preached. I am also very fond of lamb chops, and last year I purchased some of the best registered sheep I could secure and thought I was going to be very happy, but some of my neighbours have been telling me not to allow the sheep to run in the orchards; that the grease from the wool will eventually kill that orchard. I don't believe it, but I simply wish to know if Mr. Smith has ever found anything of the kind. To avoid paralysis, I found that the best way was to keep the sheep fat. As far as damage to the trees was concerned, I found that they did far less damage than the pigs.

MR. SMITH: I do say that in all my experience I have never known of an instance where sheep did any damage to an orchard, either from grease or anything else. But I will say this, if you are running sheep in an orchard and find that they deposit grease against any particular tree, a very slight application of

lye will take that grease off readily and will not leave any bad effect. I doubt whether a few sheep running in an orchard at the rate of two or three sheep to the acre, would do any serious damage in the orchard; in fact, I think they would be a benefit. I have not found that practised very frequent, but I have found it and never yet found any bad results from it. You find that oftener in New England than out West here.

MR. TAYLOR: What about pigs in an orchard?

MR. SMITH: I have found that they are not harmful, provided they have rings in their noses. Another thing, the gentleman spoke about his sheep; he thought that if they were well fed he would have no trouble. Now, you will find that if you will provide charcoal salt for your pigs and feed them always so that they will come up lively to be fed at feeding time, they will never be hungry and squeal and annoy your neighbours. (Laughter.)

Dr. RUTHERFORD: I may say I think you can be perfectly easy concerning grease on trees. The grease on the wool of sheep is of a peculiar nature and it does not require lye to take it off, as ordinary water will take it off. Moreover, the sheep never rub unless itching from a parasitic disease, and dipping will do away with that.

Mr. JOHNSTONE: Thank you.

Mayor CONKLIN: I would like to give my experience regarding grease. I have had no experience with grease in an orchard, but I have had experience with willows on the prairies, which are a little tougher than fruit trees. There were quite a number of willows and they were supposed to be the greatest evil we had to get rid of, but in two years' time, while the sheep were running among them, every willow tree died, simply, I took it, through coming in contact with the grease on the sheep. It poisoned them right to the root, and it was easy to hitch on to them and draw them out to clear the land. So my impression is that if you put many sheep among your trees, it is almost certain that they will poison those trees.

Mr. SMITH: I may say that my judgment would be that those willows died from packing the ground so tight that the air was shut out, rather than from rubbing against them. Packing the ground very tight will ruin trees, and a tree in order to live must have air as well as moisture.

Mr. PEARCE: Don't you think the willows might have been killed by the sheep nipping off the young growth giving lungs to the tree?

Mayor CONKLIN: These willows were 20 feet high.

Mr. PEARCE: I do not think that would make any difference.

Hon. PRICE ELLISON: If there is anybody in this audience who wants trees trimmed well, up to 3 or 4 feet high, I have got the experience. The sheep got in by mistake last year and did great damage to 500 trees. My advice is to keep the sheep as far away from the orchard as you possibly can, for they trimmed the trees as clean as you could have done it with a knife.

Mr. TAYLOR: I have some sheep all the time in my orchard at the coast and, outside of nibbling a few branches as far as they could reach, I have never lost a single tree from rubbing. I don't believe in the theory of oil. In my district, it is quite common for people to keep sheep in an orchard, and I have seen very little nibbling of trees except one year when we had a very heavy snowfall.

Mr. JOHNSTONE: I may say I kept my sheep all last winter in the orchard and fed them all the good hay on it, and certainly they never touched a single tree.

Hon. PRICE ELLISON: How old was the orchard?

Mr. JOHNSTONE: They had the run of the whole place—8 years old and upwards. This year they have taken the leaves off the trees but did not touch the bark.

Mr. LLOYD: It is really a question of the age of the tree as to what damage is actually done. Young trees, from yearlings up to 5 or 6 years, would always be in danger, but when they are eight or 9 years of age, they are sufficiently developed to resist any outward injury that a few sheep would do. I think it all resolves itself on the age of the tree.

Mr. MUTCH: I don't think it is fair to saddle Mr. Smith with any of the discussion that has taken place in regard to sheep. Mr. Smith's argument was the advocacy of cows for the fruit growers, and I don't think there is a place on the American continent where Mr. Smith's address can be applied with more direct benefit than our community right here. (Hear, hear.) I was very pleased, indeed, to hear what Mr. Smith has had to say on the subject and my only regret is that we were not all aware that Mr. Smith was going to address us on this subject, so that we could have had all the fruit growers of our community here to hear that.

For the last two or three years, I have been advocating just along the lines of his discussion, but without any of the knowledge he was brought to bear on the subject. I had to gather as I went along. It would be news possibly to many of the men in this hall, that the majority of the men here are using canned milk and canned cream and case eggs purchased in the cities, in preference to growing them, simply because they have been specialized off the face of the earth by the advocates of the single-crop orchard. From the very first start of the settlement of Penticton, the whole cry has been fruit, fruit, fruit, without any of the sidelines that should go along with the fruit growing. I regret that I was not aware before of the nature of Mr. Smith's address so that I could have

gathered every man in the community who is interested in fruit growing, to hear what he has to say. I would like very much, if possible, to have Mr. Smith give us—not the same address, because I don't think he could—but, a similar address, and we will endeavour to get so many of our local people here to hear it and be benefited by it as we possibly can do. (Hear, hear.)

Mr SMITH: I will say this, any time you want to get a crowd together here or somewhere else, it does not make any difference, I will talk five minutes or five hours on the subject. (Laughter.)

CHAIRMAN: The next address on the programme is by Mr. William Young, Comptroller of Water Rights, British Columbia Government, the title of his address being

WATER ADMINISTRATION IN BRITISH COLUMBIA.

Mr. YOUNG: Mr. Chairman, ladies and gentlemen,— When the secretary of your Association wrote to me asking that I give this paper, he asked that I confine myself to twenty minutes. Now, there are probably a dozen aspects of the matter that would take all of that, so that I can give you only a few general remarks on the subject.

CHAIRMAN: The programme is such that if you find it more convenient, you may take a longer time.

Mr YOUNG: As the province has developed since 1900, and large undertakings were launched, whether in irrigation or land, development of power or construction of waterworks, it became more and more obvious that administration under the Water Clauses Act of 1897 was ineffective.

The Water Act of 1909, an attempt to overcome this ineffectiveness was good so far as it went, but the difficulties that arose from year to year necessitated the annual amendment until, I am told the Water Act became the joke of the session. Those, however, who have made a close study of water administration consider the amendments of 1913 and 1914 of far-reaching importance, for they not only provide that which the Act was lacking in, namely, administrative machinery, but created such order in the arrangement that now the procedure can be easily followed.

The Act of 1913 came in for much criticism, a great deal of it unmerited. Talk, however, is cheap and the opinions expressed would fill volumes. Improvement comes only through experience, and the Act of 1914 as it stands may be said to represent the effort of not only experience in British Columbia, not only the experience of many who have given a lifetime to water administration in America, but also the investigation of the water laws of the Empire. We do not claim that the Act is now perfect; conditions have arisen and will continue to arise that will, from time to time require addition and possibly amendment to meet them.

The purposes for which water rights may be acquired are fourteen in number, as set out in the beginning of the Act, and if you will read through the Act you will find that, of these, three purposes stand out with prominence:

1. Irrigation by individual, community, company, municipality or corporation.
2. Power.
3. Waterworks.

Around these the administrative machinery is being built,such machinery being capable of taking care of the remaining purposes, which are also important. A broad distinction in purposes, however, may be said to exist; purposes that affect the public interest and purposes that affect the individual. In the light of this we have the Water Rights Branch in a process of organization to effectively administer these great purposes in particular. Beginning March 1, 1913, each step taken has been retained but it will require time to complete if the best results are to obtain.

Investigation of conditions during 1912 showed conclusively that before water rights throughout the province, including the Railway Belt, could be administered with any satisfaction, old records, of which there were about 8,000 would require investigation and adjudication thereon. Although a Board of Investigation was provided under the Act of 1909, effective work was not accomplished until after the amendments of 1913, and the acceptance of the amended Railway Belt Water Act of the same year. If any success has resulted from the efforts of this tribunal during the last two seasons, it is as much as anything due to the fact that before a hearing was held, the board was in possession of engineers' reports and maps that set out the facts. These hearings were very different from those formerly held without such information. This work of making reports for the board since April 1, 1913, has taken fully nine-tenths of the time of our district engineers. This season will see it complete, so that now our staff is gradually working into the duties of administration in its several phases. Before I leave this matter of engineering investigation, I would like to mention that it means the preparation of 8,000 plans of various sizes, of which 2,000 are complete, and as respects the season of 1913, out of a budget for that year of $145,000, an expenditure of $90,000, the balance $55,000, less a surplus at the end of the year of $2.75, representing cost of administration.

Concurrent with the time the board was reorganized and its powers enlarged by the amending Act of 1913, the office of water commissioner, or comptroller, was confirmed with enlarged powers and to assist him, provision was made for the creation of districts and the appointment of engineers with specific powers.

With this basis established, what remained then was a system for administration that would be efficient and at the same time effective. Considerable progress has been made at the head office with a system particularly adapted for the business of administration. District offices have been opened, which with the specific powers conferred on district engineers, have in many districts proven of assistance to water applicants and users, and that there might be uniformity of effort, an order of work was adopted comprising eight different lines:—

Systematic and continuous work in stream gauging.
Study of the proper duty of water.
The prevention of wasteful use of water.
Policing of streams.
Economic distribution and delivery of water.
Inspecting water systems to determine their efficiency and safety.
Determination of storage possibilities.
Investigation of water powers.

As already stated, practically nine-tenths of the time of the district engineers and field forces have been taken up with investigation of old records and in the circumstances the administration of water under the several heads could not be carried out during 1913 in the manner we would have liked. Now that this special work is about finished, the main work is gradually being taken up and already considerable has been done in one or other of the lines mentioned.

You will note that this order of work involves the three great purposes referred to, which are of greater or less importance according to the district. In this district that which is of greatest importance is irrigation, although other purposes have their place.

IRRIGATION.

Administration of water for irrigation is undoubtedly the most complicated. Prior to the Act of 1914 there was no provision that would enable the officers to cope with conditions that existed, and in the circumstances their hands were practically tied. The Act of 1914 included new sections which comprise the basic principles that make administration possible. These are as follows:—

"Limiting the quantity to beneficial use." that is to say: the quantity of water used per acre shall be limited to such quantity as experience may from time to time indicate to be necessary for the production of crops in the exercise of good husbandry.

"Rotation in use," when a number of water users may arrange a system of rotation that will best meet the requirements of growing crops and at the same time secure an economic use of water.

"Consideration of the particular crop grown," a provision which opens the way for adjustment that is in the interest of a community as a whole.

It is not the intention to take up your time here in an argument on what kind of crops should be grown; for example whether a man should grow timothy and attempt a second crop, or grow alfalfa securing several crops and with greater economy of water. I do not consider myself qualified to discuss such an important subject, but as respects these principles and their administration, I am reminded of a statement of Sir William Willcock's in reference to control of use of water in the prevention of deterioration of the land, as follows:—

"In this respect the Government is autocratic, and can and must enforce the regulations devised by its experienced advisers. It need not await the slow education of the great body of water users before adopting those practices which experience has shown are neceassry for the general prosperity."

For the administration of these principles, the powers of the district engineers were enlarged and in carrying out any rotation of water, they may arrange, when necessary for the appointment of water bailiffs whose duties and authority are clearly set out in the Act that there may be no minunderstandings.

Then there are other important features that permit of effective administration and enable organization that will mean not only development, but co-operation among farmers: These are

Water users communities with or without limited liability.
Mutual water companies.
Public irrigation companies.

Time will not permit of reference to these, other than to state that, with those basic principles that make administration of water for irrigation possible, they are the reply of the Government to the resolutions passed at previous conventions of this Association held in British Columbia.

POWER.

The administration of power; This purpose and its administrative requirements has received quite as much consideration as the purpose of irrigation. Recent amendments to the Act in this respect were few, but of great importance. It is no longer possible for a company to organize with the minimum of capital permissible in the Companies' Act for an undertaking requiring several millions of dollars for construction. Administration in the long run is now simplified by making it impossible for a speculative element to secure and hold a valuable franchise, and since the purpose of "Power" is governed by the rules and regulations that provide not only for construction within a reasonable time but regulation during the time of operation.

The chief work of the power administration begins with the operation period. For the present the determination of fees to be charged is occupying our attention. Under the rules and regulations they may be based on reasonable station output. This year we are taking this as the average daily horse-power arrived at from the total annual output in kilowatt hours at the power-house switchboard.

Hydro-electric power, however, is a specialty and we will in due course have a section of our staff devoting its whole time to its administration and study. As respects the latter, the problem that is of economic importance is "to what extent should the Crown become interested." We have the example of the Ontario Hydro-electric, the progress of which we must follow, analysing reports and criticisms pro and con. And there is the other side, the principle that all public utilities as natural monopolies be placed under regulation by the Crown.

The work of investigation of water-powers will include all streams that promise power, be they small or large. The value of the small powers cannot be overestimated; their investigation will be thorough as reliable data on a small power which may mean to some community in its vicinity, the establishment of an important industry.

WATERWORKS.

The third great purpose to which I have referred as being of public interest is waterworks. There are some here who have lived in eastern cities and came through a scourge or two of typhoid. To you the importance of proper administration cannot be over-estimated. Aside from the general office work in the issue of licenses, we have kept an engineer and party investigating watersheds from which domestic water is drawn by centres of population. The order of work is:

Determination of drainage area.
Extent of run-off or systematic stream gauging.
Timber cruising to determine how much is merchantable and whether or not the timber as a whole is a factor in the regulation of stream flow.
Alienated timber.
Alienated land: the purpose for which it is held.
Other rights whether water or mineral and the use to which such are being put.

The value of the results to be obtained from this work must become of greater importance from year to year, and with the co-operation of an active Provincial Board of Health there should be available for the various centres of population, data that will be a guide in securing and guarding sources of pure domestic water.

CONCLUSION.

I have referred to the duties of the district engineers as covering those great purposes. It must be obvious to you that it will be impossible for them to give every line of work laid down the attention it merits. For example, take "duty of water," a work that will demand the whole time of one man who must specialize in it. It is not the intention that the district engineers shall be relieved of responsibility here; on the contrary their co-operation is essential. Then again there is special work arising in the formation of irrigation corporations, a work on which the Board of Investigation and the comptroller and staff have a joint responsibility and although the prospective corporations now before us are being dealt with, a qualified man must be placed in charge of some phases of it. The administration of power and waterworks require similar treatment, and what about stream gauging?

When the province took over from the Dominion the administration of water rights in the Railway Belt, the latter decided to continue on with its hydrographic survey. It was considered that it would be advantageous to the province if it could co-operate with the Dominion along lines similar to those in operation in the United States. An agreement was accordingly arrived at, and so we have the British Columbia Hydrographers who are now gauging all the important streams south of the Railway Belt. These men have no administrative powers in respect of water rights, they are simply observers and recorders of stream flow and run-off from year to year over periods that will give complete cycles for each stream. Our district engineers are to an extent relieved of this

work, except in sections where irrigation is practised and administration directly depends on it.

Now, it may appear to some that since the procedure in acquiring water rights is fixed by law, officers empowered to issue and administer rules and regulations approved of by the Lieutenant-Governor in Council for carrying out the spirit, intent, meaning and purpose of the Act, and an order of work laid down, all that is expected of the officials is that they carry on the work as systemtized. There is, however, a larger sphere that can only be appreciated by a vision of what British Columbia might be if its population was four million instead of 400,000. If the administration of water rights is to count for anything, the requirements of the different sections of the country must be anticipated. If this valley is to develop, hydrographic and topographic surveys are as necessary as land surveys. It will be of interest to some of you to know that within two years there will be a complete topographic survey of this valley for the determination of watersheds, the work now being well advanced. It is hoped that by that time every creek in the valley will be traversed and every reservoir possibility investigated, stream gauging all the while being carried on.

Just another instance of the importance of anticipation. In the recent report of the Agricultural Commission reference is made to well drilling, and in all probability it will be considered when Parliament again meets. If the problem is to be intelligently dealt with, then the Honourable the Minister should have a report of what has already been accomplished in the province. By December it will be complete and will comprise an analysis of the attempt of fifteen years ago in the Railway Belt and complete information of some 200 wells in the Fraser river delta. Also general information of how this work is handled in other countries with figures of costs in detail. Well drilling means large expenditure of money and for that reason, if any policy is formulated it must be upon lines that will ensure the greatest success possible.

The success of any administration depends upon the principles laid down. In the case of water rights, a knowledge of business, engineering, and some branches of law is involved. Because of this, the principles enunciated by a recent writer particularly apply. These are:

Decision.
Initiative.
Preliminary planning.
Subordination of detail,
Discipline, and
Concentration to secure success.

Notwithstanding what may be your opinion of how far we have applied the first five of these, we have lived up to the last one in respect to the old records. As already stated this special field work will be practically completed this year. The success that has attended the Board of Investigation in its adjudication is encouraging. Out of 3,000 decisions to date, but three appeals have been made, and two of these are now in default. We are hopeful this measure of success will continue, and as respects administration a beginning has been made.
(Applause.)

CHAIRMAN: The paper is open for discussion.

Within the last few minutes, the following telegram has been received:

OTTAWA, Ont., August 17, 1914.

Chairman, Irrigation Convention,
Penticton, B.C.

On behalf of myself and Government desire to express cordial wishes for a successful convention. Deeply regret that the grave condition of public affairs made my personal attendance at comvention inpossible.

MARTIN BURRELL.

CHAIRMAN: The last address on the programme this afternoon will be given by Mr. L. O. Armstrong, Lecturer on Colonization. Mr. Armstrong has given over 350 lectures on colonization, in the United States, during the last year.

Mr. ARMSTRONG: Mr. Chairman, ladies and gentlemen,—I feel that I have to speak before an audience this afternoon that knows very much more about the subject than I do, but I had a great deal to do with water a good many years ago. First in the Columbia valley, I had a young brother there, one of the pioneers of the Windermere country. His potato field looked very thirsty, and so I said to them one day, "Why don't you divert that creek coming down there?" and they did with rather disastrous results. Fortunately he arrived before they were drowned out.

I feel very much in the position of the locomotive engineer who was called on by the Bishop of London. The Bishop was undertaking a very important mission in the slums of London, and he determined that the only way to make it successful was to interest the people of the slums and make them contribute towards the expense. He went to a dock labourer and said, "What will you give a month? You ought to give something." "Well," said the labourer, "you are doing a good work. I will give you two and six and give up tea and sugar."

The bishop was very pleased indeed, and turned to the dock labourer's son, a locomotive engineer, and said, "John, what will you give?" John did not think there was much fun in it, but he pondered a moment and then said, "Well, I will give you tuppence, and I will give up the salt mackerel. I don't have it often and I don't like it."

I feel somewhat in that position, but I have been spending three interesting months during the last three months, all more or less in connection with the use of water. The first month I spent in Quebec and, on two or three occasions, I discussed irrigation but they laughed and said they didn't want that there. At one point it had rained a little in May and had afterwards been very dry and they had no crops to speak of. A meeting was called and I contributed this,—I said, "You have five hundred motor-boats on this lake. Supposing you started

some of them to pumping." Most of them laughed at the idea, but two or three tried it, with such wonderful results that I expect to see in Quebec irrigation by pumping when necessary. I expect you know that province, with its big valleys, the Appalachians on the south and the Laurentians on the north. They can irrigate enormous areas and after this year's experience, I am sure they will.

Then I came up to Ontario, the old part of Ontario. There was no use talking irrigation there. They had been having some trouble with army worms and in the north part of Ontario, up the Ottawa valley, they had had some drought and there was a terrible scarcity of hay.

After that, I came to Manitoba and Alberta, and I have been travelling about a hundred miles a day all through Alberta, in motor cars, and one impression I brought away with me is that every district in Canada that is short of hay should go to middle and northern Alberta and gather the hay that is growing there. It is going to waste there this year. I see they are proposing to raise food for the Empire by sending idle people on the land, and it is our duty, who are not fighting, to help along the feeding of the Empire; and that is one very practical way, I think, to save the hay.

Among the interesting experiences during the summer, I was reminded of one by Mr. Smith's talk, and it showed me the folly of exaggerating. I was driving from Toronto to Montreal when I saw a very nice young fellow on the train. He was very anxious to be on time. I said, "What's the matter?" He said, "My old father and mother have the grippe terrible bad and I have got to get to them on time or I am afraid I won't find them alive." I said, "Don't you know a specific for the grippe?" He said "No." I said, "Canadian Club whisky and rock candy." And I got him off, along with a bottle of whisky. I saw him two weeks afterwards and hesitated a little, but finally I said, "How are the old people doing?" He said, "They have been tight ever since." (Laughter.) That gives you a very good lesson in moderation.

I am going back to the United States, and here I want to say that the American contribution to our colonization has been a splendid one. I have seen the results. During a trip to some of the back settlements, the American farmer would say, "What's the news of the war?" I told them that Canada was giving a million bags of flour; and some of them wanted to go and fight, too. They said they did not want autocracy anywhere in America, and they have offered not only flour but men. (Applause.)

I have had a most interesting time in making moving pictures of irrigated and non-irrigated bits of land, and the result is convincing. I know the troubles and the arguments against irrigation. but I have seen enough results to make me feel sure that the development of the dry parts of Canada is a dead sure thing and that farming anywhere in the driest parts is the surest kind of farming where there is water, and it is intelligently used.

I have lectured from Maine to Santiago, and have told them just what I wanted to and I have never had an insult or a narrow-minded objection. I have had a few real estate men object, but even there I have had a full audience, and an audience that would not listen to objections; that speaks splendidly. But remember, we have done the same thing. We have had American agents come and lecture to the people in Quebec and Ontario, and they have filled up

Michigan and other states and there was never an objection. We had no West then. There was no way of getting into the Canadian North-West, and in that connection I am reminded of W. W. Ogilvie. He said that his father was a baker, but that he got a little better education and thought it would be fine to be a clerk in Bruce Mines. So he went up there and had a very hard time. The schooner was wrecked and they had to go all that winter on scrapings of flour which they mixed with bark. So he made up his mind when the spring came, that the flour business was good enough for him and he gave up mining and came back to Montreal. He died, as you know, a multi-millionaire, and the biggest individual flourmaker in the world.

Now I want to say that I am thoroughly loyal, and that I believe members of my family have fought in every war in the British Empire, but we cannot expect all our immigrants to be that loyal, because they were not brought up that way. If they turn out to be good citizens and do things quickly and well, what more can we expect. (Hear, hear.)

I remember how my friends in Ontario and Quebec laughed at me and said, many years ago, that it was ridiculous to ask anybody to come out West, and I said, what about the valleys of British Columbia and the coast? They said it was no good, there was no land there. Well; I persisted, and you can imagine the interest with which I travelled across those prairies and down these great valleys, and have noted the wonderful transformation that has taken place. It makes my life one of intense interest, and in noting the constant development and comparing it with that of the United States, it makes me feel more active and gives me more enjoyment in the prosecution of my work than ever before.

Now, I dont' want to be vain-glorious and teach conceit. When one comes to my age and looks back, it is difficult to imagine how personal conceit can find any place. If everybody only knew us as we are how little room there would be left for conceit, but there is also something to be ashamed of and if we do not all do our best to make this country what it ought to be, then we may have that feeling of shame. Let everyone of us contribute towards making this portion of the Empire what it ought to be. (Applause.)

CHAIRMAN: I will announce again the meeting of the Committee on Resolutions immediately on the adjournment.

I want to call your attention to the programme this evening. It will be just as printed on the programme. There are only two speakers, and both gentlemen are here, and I can assure you there is going to be the treat of the convention this evening, and we want a good attendance. It will begin promptly at eight o'clock and the meeting is now adjourned until that time.

MONDAY EVENING SESSION.

CHAIRMAN: Ladies and gentlemen.—Before beginning our programme, will any of the delegates who hold standard certificates kindly come up and turn them over. We need about ten more to make up the necessary number.

It will hardly be necessary for me to introduce the first speaker of the evening to a Canadian audience, particularly to an audience in Western Canada. Doctor Rutherford, who is Superintendent of Agriculture and Animal Industry for the Canadian Pacific Railway, is to give us an address entitled:

INTER-DEPENDENCE OF FARM AND CITY.

Dr. RUTHERFORD: Mr. Chairman, ladies and gentlemen,—I have never attended or had the pleasure and privilege of addressing an audience in the Okanagan valley before, although I have spoken to a good many Canadian audiences and a great many audiences in Western Canada. On this occasion, when I see such a very large and intelligent audience, and particularly so many members of the fair sex present, I feel somewhat embarrassed. In fact, I feel somewhat mortified, and I may explain the use of that word, which is not very frequently heard nowadays. After the very eloquent addresses we have had to-day, I feel rather like the old servant who had been on a holiday and had made, on the way back, a sea voyage from Stranraer to Glasgow, a hundred miles, of which about sixty was in the open Firth. After she got home, she was asked how she enjoyed her trip. "Oh," she said, "it was grand altogether—a grand trip, except that sea voyage. There was an awful storm. The captain said he had never seen such a storm before. We were all verra sick and I was most terrible mortified. I was never so mortified in my life."

"Well, that is too bad, but why were you mortified?"

"Eh, I was in the ladies' cabin and I was terrible mortified."

"Yes, but why?"

"Well, you see, ma'am, there were a lot of gran' ladies, and I was terrible mortified."

"And can't you say why you were mortified?"

"Well, ma'am, there was a lot o gran' ladies and they had been eating all kinds of gran' things, pies and cakes and puddings, and we were all verra seasick, and I hadna a thing to show but plain parritch." (Laughter.)

Well, I feel very much the same. After the eloquent addresses of our friend, Mr. Smith, and a number of others, to mention which would perhaps be to invite invidious comparison, I feel that I have nothing to offer but "plain parritch."

There is, however, no subject in the world which appeals to me more strongly than the one which forms the title of the few remarks I propose to make this evening, namely, "The Inter-dependence of Farm and City," the inter-dependence of the rural community and the urban community.

We have recently heard much of the Great Illusion, and Norman Angell has certainly set forth most clearly the great illusion of war. There is no question at all that war to-day is obsolete, but this war in which we are now engaged is a righteous war—the most righteous war I have any recollection of—and we trust to come out right in the long run. (Applause.) To my mind, however, there is an even greater illusion and that is in regard to life and what life is and to what life owes its being and what the duties of life are. We find now both in the old world and in this great new world of ours, an overwhelming tendency on the part of people, particularly young people—although it is not confined to

them, there are a great many people old enough to know better following the lead of the young people—to crowd into the cities and away from the land. Our public men are also victims of this illusion. We find that our press, our daily press, is, to an enormous extent, subject to the great illusion; the illusion that the world can go on, can live or move or have its being independent of the land, of the farm and of the farmer.

When one considers that if it were not for agriculture, for the farmer, and the farms, we would have no great institutions; no great railways; no banks; none of our great financial organizations; none of our great industrial establishments; none of our great commercial enterprises: that they are all absolutely dependent on the farm and on the farmer, and how people are forgetting that great fact—when one considers the inevitable result if the present conditions continue, then the unreality, the fictitious nature of the life we have been living, will become apparent. I speak somewhat feelingly, because I happen to be living in a city which is a marvel in its way, the City of Calgary. I was in Calgary seven years ago last spring, when I don't think there was a foot of pavement in the whole city. There were no paved streets and they had just started a couple of motor busses to accommodate the people in the outskirts. To-day, it is a city of not less than 80,000 people; a most modern city, with nearly one hundred miles of paved streets, nearly one hundred street cars in full commission; great big sky scraper buildings on corner after corner, and I often ask my fellow citizens in Calagry what it is all about, where it came from and how it is going to stay, in view of the fact that they have so far done practically nothing to assist in the development of the agricultural interests in the adjacent country. All through the Northwest we find the same thing. These big urban communities are springing up; they are being built on adventitious capital; on borrowed money, and the people apparently do not realize that unless the country surrounding them is developed from an agricultural standpoint, their existence cannot continue.

There has been far too much tendency on the part of the press, and on the part of many people who ought to know better, to belittle the farming profession. As a matter of fact, the business of farming is the business of the world. We in Canada are very fond, in our immigration literature and elsewhere, of boasting about our agricultural pre-eminence, and yet we are great importers. As you have just heard, British Columbia alone has imported in the course of a year, twenty million dollars' worth of foodstuffs. When I used to live in Manitoba, I was often surprised at some of the farmers living there—but these were not the real farmers, they were grain miners, land robbers, gamblers, dead game sports—willing to stake everything on the turn of the weather, or the turn of crop and, unfortunately, occasionally—I say unfortunately advisedly— they succeeded. I used to see these so-called farmers without any milk in their tea, unless they got it out of a can; buying potatoes from the grocers; loaves of bread from the baker, and there were butchers' wagons going all round the country peddling meat to these practical agriculturalists. I have even seen farmers hauling out a few bales of hay from town to feed their horses through seeding. We may laugh at farmers such as these but how much wiser are we as a nation. The individual farmer has an advantage over the rest of us, because

he can raise almost everything that constitutes a living in this country, whereas the man in the city has to find the money to pay for these things, but before we laugh too heartily at the individual farmer who buys condensed milk, baker's bread, vegetables, butter, meat and hay, we had better take one good look at ourselves as a nation and as a country.

We are importing to-day from Australia and New Zealand, enormous quantities of mutton. For a long time it came in on the Pacific coast only, but for nearly three years now, that mutton has been coming in by the eastern coast as well — from St. John in winter and Montreal in summer — and travelling westward until the mutton from the Atlantic and the mutton from the Pacific have met midway on the prairies. We have in Canada millions of acres of good sheep pasture. Mr. Armstrong pointed out what a pity it was, or rather what a sin it was, that the good grass in the northern parts of the Province of Alberta should grow up and wither when it might be made use of as provender for the horses, so that we could ship the hay grown in the eastern provinces to the seat of war. We have millions of acres of good sheep land, the grass on which goes to waste annually. We have in this great agricultural country of ours, two million sheep — two million sheep! The Republic to the south has fifty-two million; the good little old British Islands have thirty-four million; Argentina has thirty-eight to forty million and Australia one hundred and ten. At the present time, we in Canada, have two million sheep and we are buying from Australia, both in the East and the West, and also bringing in large quantities of live sheep and dressed mutton from the Pacific Coast states to the south. Last year and the year before sheep were coming into Toronto, going from Wyoming to Chicago and thence to Toronto, to Cobalt and Ottawa, down to North Sydney and Cape Breton and being shipped from there to Newfoundland. Not only that, but we can go out right here, I may be wrong; you may not be as far advanced as other communities; but I venture to say we can go out here in this town, and go into one of your shops and find a large yellow tin, labeled "Fray Bentos," containing corned beef, and very good corned beef too. This beef is put up either in Argentina or in Uruguay and shipped from the River Plata across to England and back to Montreal, or it comes from England round the Horn to Vancouver. It is shipped by rail into the prairie country from Montreal, and is sold to us in the great beef producing country of Alberta; this beef has made the voyage from South America to Europe and back again and three parts across this continent. Evidently when we consider our position as a nation we have not very much to say about the farmer who buys condensed milk and baled hay.

Now, I am not telling you this to amuse you; I think it highly discreditable that in the face of such conditions a great country like this should, for the last ten years, have been busy building up urban communities at the behest of the real estate man and borrowing money all over the world. Mutton from Australia, butter from New Zealand, beef from South America, eggs from China; isn't it fine. What a reputation to enjoy! We build up our cities and draw our young people by the attractions of the electric lights and the "movies" away from the farm; and they walk mincing along the street, and if they see a fellow with a homespun shirt and overalls, they turn up their noses and say he is a

hayseed. (Laughter.) We are going very fast in this country, but we are going a little too fast. One must take time to think. We must get down to brass tacks (applause) and realize where we are at.

Now, you may say, what has all this got to do with the inter-dependence of the farm and the city. Well, the sooner the business men of the cities wake up to their responsibilities in this connection, the better for all concerned. There is not a town or community in Canada which should not be putting its best brains into the solution of this great problem. There is not a city council or board of trade in the whole Dominion that ought not to be giving the most careful consideration to this matter. We are waking up though but very slowly in the prairie country. We have several communities going now. North Battleford, for instance, has established the North Battleford Live Stock Company. The city of Lethbridge is doing some aggressive work, and the city of Canora, in northeastern Saskatchewan, is following on the same lines. The city of Calgary is also becoming alive to its duty in this connection. When we consider that farmers last year, were getting seven to seven and a half cents a pound for live hogs in the Calgary market, while the price of hogs in Toronto and Montreal was from $10.40 to $11 a hundred, and that at the same time the wholesale price of bacon and hams in Montreal was from twenty to twenty-two cents, and the wholesale price of bacon and hams in Calgary from twenty-three to twenty-six, the need for intelligent action, there or elsewhere, must be admitted.

It was mentioned to-day that it is not uncommon for farmers to get into financial difficulties through misapprehension — I want to put that as mildly as I can — through misapprehension of the possibilities of the district in which they decide to settle and invest their little all. If some reports were true, it might be said that it was through misrepresentation, but I want to be fair and mild, so we will say it is through misapprehension. They get into one line of farming, one line of production. On the plains it has been growing wheat, while here it is fruit, and they find themselves in difficulties through not getting the returns from the one line of farming they have been induced to believe that they would; and right there is where the city can do a very great deal to help the farmer out. To give an illustration of the difficulties into which people get by sticking too closely to one line of farming, I may just cite a statement made by Professor Worst, of the North Dakota Agricultural College a year ago last January before the Tri-state grain growers' congress held in Grand Forks. The United States Government, after a very careful research extending over many years, has ascertained that the average cost of growing a bushel of wheat is 58 cents. In Saskatchewan, I think, a special commission placed the sum at 55 cents. I suppose on account of the land being newer and the yield correspondingly greater. Anyhow, there is not much difference. Now, Professor Worst figures that a 20 bushel to the acre crop means the extraction of 46½ cents per bushel from the soil in fertilizer. Add that to the 58 cents and you get $1.04½ which that bushel of wheat has cost the farmer, because 46½ cents is capital invested in that bushel of wheat. Now, if that is sold for 60 or 70 cents a bushel, you can easily see that it is going to take the country a long time to get rich at that rate. Fruit trees, possibly, don't exhaust the soil so rapidly, but I entirely

agree with Mr. Smith that any farmer in any country has got to go in for diversified farming, and so conserve so far as may be possible, the fertility of his soil. He must provide from his land, as far as its potentialities will warrant, everything he requires for himself and his family, and when he has done that, he is a long way ahead of the game, and is in a position to go forward and by the intelligent disposal of his surplus products, do much good both for himself and the country in which he lives.

Now, to get back to North Battleford and Lethbridge and Canora; these cities have realized the true state of affairs, and have made arrangements with one of the leading Canadian banks whereby they can and do supply selected farmers with live stock on easy terms of payment, and the scheme is working very well and doing a very great deal of good. Every community in the country ought seriously to consider the inauguration of co-operative action between the city and the country, the farmer and the town, because it is wonderful what can be done in that way. I am not here to advertise the Canadian Pacific Railway Company, which is my employer, but I want to tell you briefly what we are doing. Within a little over two years we have bought for cash over six thousand head of cows and heifers, and a large number of hogs, and have supplied these to settlers on the Company's land on long and easy terms of credit. We are doing what we can and the work is going bravely on. It takes a great deal of money and effort, as well as close observation and careful watching. We cannot be as careful in our selections as these organizations to which I have alluded, but the results are very encouraging and the amount of money in the shape of interest and payments on principal which from time to time keeps coming into my office is surprising. I know that many farmers who two years ago were in very unpleasant and distressed circumstances, are now finding their feet and getting along exceedingly well. Their children are better dressed and the mothers are better dressed and much happier looking and, in some cases, even the fathers are less grouchy than before the campaign was inaugurated. (Laughter.)

It is not only financial assistance that can be given by the city to the country. The city of Lethbridge is a very enterprising place. If the finances of the city of Lethbridge were commensurate with the enterprise of its citizens, it would be one of the most wonderful cities on earth — I don't know but what it is anyhow. They have organized what they call the "Country Cousins" section of the Board of Trade, and every farmer in the district is made to feel that he is welcome to the meetings, and if the members of the board can give any advice or assist the farmer in any way, they are only too glad to do it. They are breaking down the fence between the farmer and the city man, and that is the proper thing to do. We want to give the farmer in every case where it is possible and where he is willing to accept it, the benefit of the experience, the financial, the business knowledge, which the city man possesses; at least, which many possess. There are some exceptions which prove the rule, but in every community there are men who have the knowledge of business which the farmer, from his environment and training, is not as a rule expected to have, and all these things can be worked out.

Take co-operation: those who are familiar with the Canadian farmer know that he is not a very good co-operator. He is a poor hand at co-operation. It

is true we have in eastern Canada some very fair co-operative organizations; the creameries and cheese factories have been as a general rule successful. The co-operative packing houses, however, were a failure. The farmer could not stand the temptation of the combine when it offered a cent or a cent and a half more than his own packing-house could offer, and in that way the big combines soon cut them out of the way. It is astonishing what can be done in the way of co-operation. A great many business men are afraid of that word. They say, "We don't want it, we want the farmer's trade in the ordinary way," but they should realize that if co-operation will make the farmer prosperous, the very best thing they can do is to help the farmer to co-operate, because their own prosperity depends on his. Co-operation is spreading all over the world. Co-operative credit in Germany and in many other countries has made tremendous advances. The German peasantry save very large sums of money and develop their resources in a most remarkable way; the same is true of Italy and of France; but perhaps the Scandinavians and particularly the Danish, are the best co-operators of all. Even Ireland, rather strangely, is making a great success of co-operation in several important districts under the policy introduced by Sir Horace Plunkett and so ably carried on by the Board of Agriculture and Technical Education at Dublin. In Denmark, co-operation in a great many lines of agricultural work has almost reached a state of perfection. Denmark is far in advance of other countries in the breeding and distribution of stock, in feeding and marketing, and the Danes do a tremendous business in bacon, hams and butter, all on co-operative lines. When one bears in mind that Denmark is a small country with a rather unfavourable climate, it is interesting to note that it has the largest agricultural trade in proportion to its size and population of any country in the world. The total exports are about one hundred million dollars a year, of which approximately ninety millions consist of agricultural products, and in these lines the Danes are our closest and keenest competitors in the London market. It is almost impossible for any other country to seriously compete in class and quality with Danish bacon and it is the same with butter and eggs and many other similar products.

To show what can be done: co-operation is of comparatively recent growth there; in 1888 they had one pork factory which handled twenty-three thousand hogs; and twenty years later in 1908 they had thirty-four factories handling over a million and a half of hogs bred on the best lines and in the most intelligent way; fed in the most intelligent, economical and effective manner; and marketed under the most favourable conditions; and when they are put on the market, the farmer gets the profits. I know a Dane now in Alberta, a very good man, getting rich where other people are getting poor. You know one finds all through the Canadian West, and I am willing to risk the statement that the same conditions prevail here, that two men may be sitting down on adjoining parcels of land, under exactly the same conditions, financial and otherwise, equal in every respect, and yet one man steadily gets rich and the other man as steadily gets poor. Have you not got that condition here? Yes. I thought so. You have never been anywhere where they did not have it, and this Dane in Alberta is one of those who are getting rich. He has grasped the great point, that the first thing to do is to establish a home. Like the old Scriptural text, if a man

establishes a home, he is not very long getting the other things about him — "Seek ye first the Kingdom of God and all other things shall be added unto you." I will just give one illustration, and the ladies will pardon my plain speech, but there was a sow and this man owned it, and she was a very good sow in some respects but not in all, for she killed her pigs, a most reprehensible thing to do, and the man decided that she would not be profitable to keep under the circumstances, and so he fattened her and eventually was offered a price of $15 for her. But he sold her for nearly $75. He killed that sow himself, dressed it himself and made use of every little bit that it was possible to use, and he cured the bacon and cured the hams, and he sold them to a railway contractor for his men to eat, and cleaned up exactly $73.75 for the sow for which he had been offered $15. There is only one little illustration of what can be done by the use of intelligent methods in farming.

If we want to improve existing conditions, we must get our city men to take a real live interest in the farm and in the farmers; to help them along and assist with advice; to make financial arrangements for them when they are in a tight place, provided they are the kind of men to appreciate it and redeem themselves later; and then we will be doing a very great work. We will be doing something to relieve us as a nation from the disgrace of neglecting the one great source of wealth, the great source of livelihood, the greatest thing in the world — agriculture. You know what the King of Brobdingnag said to Gulliver: "Whoever could make two ears of corn or two blades of grass to grow upon a spot of ground where only one grew before, would deserve better of mankind and do more essential service to his country than the whole race of politicians put together." (Applause.)

I know this has been rather a dry discourse, but I warned you carefully that I had only the plainest of "parritch" to offer and I have done my best in the time available to demonstrate the importance of this great question. I think we all ought to get together the men and women living in our towns and cities, and the men and women living on our farms, that we had better look a little more closely into where the money comes from, where the sources of national, individual and community wealth are, and what they are; in every case, you will get back to the soil wherever the trails may appear to lead. We have in Canada, particularly in Western Canada, far too many of these newly rich people, the lately risens. They are very wealthy in their minds, many of them, and have fine motor cars, and put on lots of style in the matter of dress. In fact the foolish extravagance of life to-day is very painful and very ridiculous at the same time. Our people should do much more thinking than they have been doing in the last few years. Any amount of adventitious capital has been rolling into the country; money has been got in every possible way it could be got and on all sorts of security. It is true we have shared in the financial depression which was world wide and no doubt the war was casting its shadow before, but apart entirely from that, ladies and gentlemen, we have been most extravagant and prodigal in our expenditure. We have simply been blowing money in, spending it right and left like, as the old adage says, drunken sailors. But, there is always a day of reckoning. In London and in all the other great financial markets of the world, the fact that we have been over-exploiting our

natural resources is well known and thoroughly understood. The greatest curse this country ever had was the horde of human locusts calling themselves real estate men, a most unhappy and inappropriate designation, who swarmed all over the country and put false and mistaken values on the land and everything else in sight or in many cases invisible. (Applause.) If I have done no more to-night than make half a dozen people put on their thinking caps, I will feel satisfied that my little effort has not been in vain. Ladies and gentlemen, I thank you very much for your kind attention. I know the subject has been a dry one and I apologize for it in that sense, but I do not apologize a bit for telling you the plain truth. (Applause.)

CHAIRMAN: For the benefit of fruit growers who are anxious to hear Mr. Whistler, who is to talk on fruit growing, and the care of apples, I may say that he arrived to-night and will address the convention on Wednesday afternoon at two o'clock, and an hour and a half has been set aside for his address and the subsequent discussion. Deferring to the wishes of the delegates, the executive have arranged with Mr. Smith to again address the meeting at 11.45 to-morrow morning. (Applause.) We are now going to be favoured with

AN ILLUSTRATED TALK ON THE ORCHARDS IRRIGATION METHODS OF CALIFORNIA

by Mr. Frank Adams, in charge of Irrigation Investigations, University of California.

Professor ADAMS:

Mr. President, ladies and gentlemen,—The paper your officers have been kind enough to invite me to present will be confined to describing and illustrating California orchard irrigation methods from the practical standpoint of the irrigator. I shall endeavour to do this by reference to several important and typical sections. Possibly much that is in my paper will not be new to many of you. Possibly you will find that California orchard irrigation methods are not far different from, or far in advance of, those you are using. However, if the latter suggestion expresses the fact, it may be worth your while to find out from the description given by my paper and the accompanying pictures that an older irrigated section much more experienced in orchard growing than you have yet had opportunity to become has not far out-distanced you in the art of applying water to fields.

PRACTICE IN THE SIERRA FOOTHILLS.

The Sierra foot-hills of California extend over a north and south distance of 400 miles and from the higher east-side plains of Sacramento and San Joaquin valleys to elevations of 2,500 or 3,000 feet. Topographically the cultivable areas vary from gently sloping, as near Porterville, near the southern end of San Joaquin valley, to steep and rolling as about Auburn and Newcastle, on the main line of the Central Pacific, north of Sacramento. At Porterville the mean annual rainfall approximates 10 inches; at Nevado City, 50 miles northeast of Sacramento,

Some of the delegates at Eighth Annual Convention, Penticton, B.C., August, 1914.

with an elevation of 2,500 feet, it is about 55 inches. Along the lower foot-hills and higher valley plains, citrus fruits predominate, with increasing areas of olives, while deciduous fruits, chiefly peaches, plums, grapes, and pears are grown in the sections of slightly higher elevation. Above these, apples are coming to be planted in increasing numbers.

Excepting in the sections of lower elevation where much water is pumped from wells and raised 50 or 60 to 150 or 200 and, in rare instances 400 feet, water for irrigating the foot-hill orchards is generally carried in ditches and pipelines that were constructed in connection with mining development 40 or 50 years ago, and in recent years rehabilitated for irrigation and power. From these it is taken to the highest points of the orchards in ditches and flumes and pipes, much as in the orchard districts of British Columbia, in the main deciduous centre about Auburn, Newcaste and Penryn in Glacer county, delivery is made to the orchards in small streams flowing continuously from May to October, and such other portions of the year as irrigators may call for it. One miner's inch, equivalent there to $11\frac{1}{4}$ gallons per minute, or one-fortieth cubic foot per second, serves from 5 to 8 or 9 acres, and costs irrigators $45 per year, or from $5 to $9 per acre. An average expenditure for distributing pipelines and flumes on the farms is about $10 per acre.

On all of the orchards of this foot-hill section, applying water in furrows is the only feasible procedure.

Head laterals are almost invariably only furrows ploughed or slight grades around the upper edges of the fields or down ridges, in the latter case erosion sometimes being checked by frequent slight drops protected by sacks or other durable material.

When water is carried down such excessive slopes that furrow head ditches, even when thus protected, are not feasible, ordinary V troughs made of 1-inch by 6-inch redwood are substituted, and water is taken out to the furrows through $\frac{1}{2}$-inch or $\frac{3}{4}$-inch holes bored in the bottom of the troughs.

The furrows leading from the head laterals are run in numerous different ways according to soil, topography, and personal preference of the irrigator.

Sometimes they are carried directly down the main slope, one on each side of the tree row. If the slope is considerable and the soil takes water slowly, off-sets are made in the furrows just above the trees in one furrow and just below them in another, or the single furrows used may be carried in semi-circles around the trees. Another variation is to scoop out a pocket one foot or so in diameter just above each tree this being kept full of water from the furrows during irrigation. Still another way when running the furrows with the slope is to zigzag them on gentle curves, although this plan is usually only followed where the slopes are relatively low and even.

As a rule in the main deciduous fruit sections of the Sierra foot-hills not more than one or two furrows are used when the water is distributed down the main slopes, and it is not over gratifying to say that in these sections the furrows plowed out in the spring are generally allowed to remain undisturbed throughout the season and until plowing and cultivating time in the following winter and spring. It is my belief that in most cases the use of only one or two furrows for each tree row is not good practice where the furrows are carried directly down

steep slopes. Experiments made in southern California under the auspices of the Irrigation investigations have shown that lateral percolation is much less rapid than downward percolation unless the downward percolation is arrested by an impervious subsoil. The same fact was recently observed in the Fair Oaks section of the Sierra foot-hills where, after running in furrows for nearly a week, water had not percolated far enough from the two furrows to enable a sharp steel rod to be forced more than 3 or 4 inches into the soil 3 feet on each side of the furrows, whereas the rod was very easily extended into the ground a full 3 feet directly under the furrows. Where furrows are run across the steeper slopes in the foot-hill belt about Auburn, Newcastle and Penryn, they are now running less this way than formerly, three or four furrows are quite usual, but if the land is locally very uneven these must be made quite steep and then be carefully protected from gopher and mole holes or other conditions that lead to breaks and resulting erosion which may be very hurtful.

Where a considerable stream—say 6 or 7 miner's inches—is being carried down a ridge, a single deep furrow zig-zagged on a low grade back and forth between three or four tree rows is found to be effective, not only in well irrigating the ridge, but also in carrying water to smaller furrows leading on both sides from the larger zig-zagged furrow.

How long to make furrows, how much water to run in each, and how long it should be allowed to flow are all of course equally important with the number of furrows run in accomplishing satisfactory wetting.

In the Sierra foot-hill belt, the length of furrows generally does not exceed 300 or 400 feet, because, excepting down near the plains, even slopes are seldom continuous for greater distances than these. The rule followed by the best irrigators is to make furrows no longer than the desired stream will flow through in a few hours. Sometimes as much as twelve hours is required to get a very small stream from the upper to the lower end of the furrows, but so much time is obviously excessive and is bound to result in deeper irrigation at the upper side of the field than at the lower side.

The size of the stream varies with different irrigators and on different slopes and soils from one-tenth miner's inch—a little over one gallon per minute—to several inches. The division of 10 miner's inches among 75 to 90 or 100 furrows 200 to 300 feet long, with water running twenty-four hours in each furrow, which was recently noted on a profitable foot-hill orchard near Auburn, is typical of practice in this section. In this case the full daytime was required by the irrigator to get the water through the furrows and it was then left running in them throughout the night. Some orchardists in this section want the water to continue in the furrows for 48 hours and some shut it off at the end of 12 hours.

Ordinarily, with the streams of water used, about two weeks are required to irrigate an entire holding, after which the next irrigation is begun at once. When fruit is ripening the usual practice in the Placer County belt is to irrigate one every seven to ten days, with some growers irrigating even up to time of ripening.

PRACTICE IN THE CENTRAL AND COSTAL VALLEYS.

Orchard irrigation about Yuba City, in Sacramento valley, and in Santa Clara valley, 50 miles south of San Francisco, is thoroughly typical of that

throughout the main central and smaller coastal valleys of California. Deciduous fruits and nuts are the orchard fruits grown and irrigated there. In neither section is orchard irrigation practised, yet out of the transition from the crude beginning methods to the more refined methods that water scarcity in time invariably compels. In both sections irrigation water is wholly or most largely obtained from wells, with pumping lifts ranging from 6 or 8 to about 150 feet. With a very few exceptions some form of flooding system is followed in applying the water, the few exceptions in which furrow irrigation is practised mainly being of recent origin.

In flooding orchards, two plans are chiefly adhered to—basin flooding, in which levees are made around each tree or around groups of two or three trees, and what virtually amounts to border flooding, in which levees are made in the direction of the greatest slope down the centres of each row or of every alternate row.

In comparison with the so-called border flooding orchards, the basin method is relatively a refined method, for it permits of quite even water distribution.

Where a basin is formed about each tree temporary levees are thrown up, checker-board fashion, in each direction, midway between the tree rows. Sometimes these levees are merely back-furrows made with an ordinary mold-board plough. More generally, however, they are made with an iron or wooden ridger or with a disc cultivator set to throw toward the centre.

Before making the levees for basin irrigation it is usual to disc once down the centre of each row and similarly cross-wise in order to loosen the surface soil sufficiently to give ample loose soil for the levees. The breaks in the levees caused by the cross-ridging are filled by means of a one-horse jump scraper before irrigation is begun, or with shovels as a part of the labour of irrigating. The usual practice is to begin filling the basins with water at the lower ends of the rows first, always closing them after filling, in order to prevent an excessive quantity of water entering any basin, which would result in uneven distributing. Sometimes the water is run to the lower basins through the entire tier of basins lying between the lower basins and the head-ditch directly above the first basin. This plan is objectionable, however, because in following it, water runs much longer in the upper basins than in those at the lower ends of the rows. A much better practice is to make double levees in the direction of the main slope in the centre of every other row, these double levees forming a shallow surface ditch through which water can be carried to the basins on both sides. Another good plan is to carry the water to the lower basins in galvanized iron surface pipe, 8-inch sizes, costing in California about 25 cents per running foot.

The cost of ridging and checking for basin irrigation in California orchards approximate 75 cents per acre at each irrigation, provided all of the work is hired. One man with four horses will disc and ridge 10 acres in one day, and one-half day with one man and one horse are usually necessary for filling in the breaks at the cross-levees. The number of irrigations given per season in the valleys mentioned range from one to three.

Where the border plan of orchard flooding is followed it is not uncommon to run water between levees 20 to 60 feet apart as great distances as 700 or 800 feet, obviously resulting in very much more water soaking into the soil at the

upper ends of the rows than at the lower ends. Where the water is run only 200 or 300 feet this method is considered less objectionable, but at the best it is a crude plan which intelligent irrigators do not long follow.

When flooding orchards in the sections mentioned, it is quite usual to apply from 5 or 6 to as much as 12 inches in depth at one irrigation. Neither green fruit shippers nor canners seem to object to irrigating such fruits as peaches right up to the time of picking, the last waterings greatly swelling the fruit. Desirable practice in this regard has not yet been conclusively worked out, although a number of investigators in different states are considering the matter. Where Santa Clara orchardists have no pumping plants and buy water from neighbouring plants, the average price paid is around $12 per acre-foot.

Occasionally it happens that an orchardist will merely flood promiscuously, running furrows here and there as most needed to accomplish the flooding. It seems needless to say that such practice must result in very uneven distribution and much waste of water, which, at the price paid for water in such valleys as the Santa Clara, is almost the same as money. Rather hasty flooding is sometimes the only feasible way in Santa Clara valley, however, for the winter and spring freshets carried by the numerous creeks entering the valley are run hurriedly onto the land whenever available, and irrigation during rains or during blossoming season is common practice, the extent of it depending directly on the amounts of creek water available. This winter storing of water in the orchard soils of Santa Clara valley is undoubtedly good practice when not carried to such an extent that the soil is leached. In some cases, however, it is apparently carried too far.

As compared with proper furrow irrigation, neither basin nor border flooding of orchards can be considered good practice, except where land is so flat and so sandy that furrow irrigation will result in very uneven distribution. The prime objection to any form of orchard flooding is the alternate puddling and baking of the soil that results, thus inevitably leading to so breaking down the granular condition of the soil as to make effective mulching difficult if not nearly impossible, at the same time preventing that free and full soil aeration that is essential to soil fertility. Another serious objection where irrigation water is costly is the heavy evaporation loss that takes place from the irrigated soil before it is dry enough to cultivate. Even after it is possible to cultivate orchards that have been flooded, a prominent Yuba City peach grower who has made a beginning in furrow irrigation finds that, under proper practice, five cultivations are necessary after each flooding, whereas two will accomplish as much good if water has been applied in deep furrows and the surface soil not wetted.

Fortunately both in the central valleys and in Santa Clara valley a beginning has been made in furrow irrigation, most frequently, possibly, in the case of young orchards. One 120-acre English walnut orchard in the latter valley visited has been equipped with a modern underground concrete pipe and stand system of furrow irrigation. Of course, only high priced products will justify the cost of the pipe and stand systems of water distribution, yet these are not essential in furrow irrigation. Orchards having a selling value of $700 to $1,000 per acre, however, which are not uncommon either in the peach section about Yuba City or in the prune section of Santa Clara valley, should be able to bear

the slight additional capital investment of say, $20 per acre to provide a modern distributing system.

Very frequently furrow irrigation is difficult because of insufficient grading before planting. This unfortunate condition is hard to remedy, but is now being prevented by orchardists of foresight when setting out growing trees.

PRACTICE IN SOUTHERN CALIFORNIA.

The most careful methods of irrigation in America have undoubtedly been developed in the orange and lemon groves of southern California, where in extreme cases, as in San Diego county, irrigation water is sold, not by the acre-foot or the cubic foot per second, or the miner's inch, but by the thousand gallons. Scarcity of water and the delicate requirements of high-priced products have altogether been the mother there of much invention in the field of irrigation practice. In the highly developed sections earthen channels for the conveyance of water have ceased to exist, even in farm distributing laterals, cement lined channels carrying the main supplied, and masonry or concrete ditches and flumes and concrete, steel, and vitrified clay pipes distributing the smaller streams to and over the farms. The water is measured to each main lateral or to each 10-acre or 20-acre grove with more accuracy than is usual in many other irrigated sections, usually by means of locally designed devices which, although not always as accurate as might be desired, are quite satisfactory. Excepting where the thousand gallon unit is used, as in parts of San Diego county, the 1-hour inch, costing from 1.1 cents to 3.5 cents, the 12-hour inch, costing proportionately, and the 24-hour inch, costing from 5 cents to 60 cents, and averaging about 20 cents, are common water units and charges.

The water supply for southern California irrigation, although derived in considerable part from direct flow or storage of surface streams, comes in very large part from wells tapping subterranean basins. Investigations, for instance, have disclosed about 300 irrigation pumping plants within a radius of about 5 miles from Pomona, and one of the subterranean basins in this section is so rich in water-bearing capabilities as to supply upward of fifteen fine wells on a single 160 acres, the largest wells recently drilled being 16 inches in diameter. In 1910 there were 10,000 irrigation pumping plants in all of California, a large proportion of them supplying water to orchards, and owing to the very dry seasons since then the number has since probably doubled.

The heavy and increasing draft being made on the underground water supplies of some sections of southern California has led to the necessity of underground storage of the canyon streams during flood periods, the flood flow being diverted into the extensive gravel beds that feed the pump supplies. To obviate the need of night irrigation, the water supply from both ditches and wells is very frequently run into concrete reservoirs, from which an extra-sized head can be drawn during the daylight hours. These small reservoirs, costing around $1,000 or $1,500 are a very common part of the irrigation equipment of some sections.

After earthen farm ditches were abandoned in southern California, the first substitutes used were common wooden flumes of 1-inch by 12-inch material. While occasionally one of these old flumes persists, first the cement flumes and then the underground pipes have taken their place. Concrete head-flumes, costing around 25 cents per linear foot, are now chiefly used on the steeper slopes, largely because water can be more easily delivered from them to contour furrows without washing than from the stand pipes of the underground systems. Attempts are seldom made now, however, to carry these concrete flumes over depressions, although this was done some formerly. Where the flumes are used, openings are made in them opposite to each orchard furrow and various forms of checks or other obstructions are placed across the flumes just below each outlet in order to give an even distribution. Where parallel lines of these concrete head flumes cross an orchard at intervals of 300 or 400 feet, depending on how long it is desired to have the irrigating furrows, each opening is sometimes numbered so that the attendant walking along the lower ends of the furrows may identify and make note of the furrows that seem to be getting too little or too much water and then later turn more or less water into these furrows. Sometimes a masonry-lined ditch follows along the upper side of the head flumes, collecting run-off from the upper rows of furrows and carrying it to points of use lower down, possibly also, on infrequent occasions, carrying off surface wash from short heavy rainstorms.

The application of water in furrows in southern California has come to be effected in some instances with a high degree of skill. As in the deciduous fruit districts of Santa Clara valley and about Yuba City heretofore described the first orchard irrigation in southern California was by the basin flooding method. The soil puddling and baking, the poor percolation and aeration, and the high evaporation losses connected with this system were, however, very early discovered and the system almost wholly abandoned for furrow irrigation. In an occasional instance, where an orchard tract has not been properly levelled before planting, and on very porous soils, and quite largely in walnut orchards, basins are still used, an orchard with a slope of 4 or 5 feet in 100 recently having been seen being irrigated in this way in the rolling area about Glendora.

In a nut-shell, the best southern California practice in furrow irrigation of orchards has come to include from two to four furrows 6 inches to 9 inches deep and from about 300 to about 500 feet long between each set of tree rows. On very sandy soils four or more feet deep, and on soils having a gravelly subsoil, furrows are close together as 3 feet are usual. This relatively close spacing is necessary because with light, open soils downward percolation, as already indicated, is much more rapid than lateral percolation. For the same reason, as between furrows 6 inches or 9 inches deep, for such soils the former are considered by some to be preferable.

Another requirement of sandy soils is that the irrigation furrows be short, not over 200 or 300 feet, depending largely on the slope. This is necessary to insure that the irrigation stream shall not run much longer at the upper end of the furrow than at the lower end, which it invariably does with porous soils if the furrows are too long. With a given slope, the only certain test for proper length of furrows is boring with a soil tube or auger. By this simple but effective

method percolation of water below the rooting zone at the upper ends of the furrows, and insufficient percolation at the lower ends, can both be prevented. The value of the use of such tools for finding out what becomes of the water applied to orchards is coming to be quite widely recognized, not only in southern California, but throughout the state.

Where soils are of such texture as to insure wide lateral percolation of irrigation water, furrows 8 inches or 9 inches deep are used under the best practice. These are made either with a special furrower or with shovel plows fastened to the frame of a sulky cultivator, about one day with man and team being necessary to prepare 10 acres. Shallow furrows in soils that readily absorb water laterally inevitably results in surface wetting, which is against every principle of good irrigation practice, as already emphasized, among other reasons, because it retards deep percolation by preventing free air passage in the soil, prevents early cultivation, puddles the surface soil, and results in much loss by evaporation.

In all furrow irrigation, two difficulties are met with which do not occur in basin flooding. One of these is to wet the spaces parallel with the furrows directly in the tree rows; the other is to prevent run-off at the lower ends of the furrows.

For wetting the space directly in the tree rows, zig-zagged around the trees, or checking the flow in the furrows nearest the trees so as to make it run fully across or to the centre of the dry space and back again, are the usual methods. It sometimes happens that orchardists cross-irrigate every other irrigation but this practice is not common in southern California.

For preventing waste of water at the lower ends of furrows some plan of checking or zig-zagging is necessary. Sometimes this is done only at or near the lower ends of the rows, and the irrigators' ingenuity must be relied on to decide how best to proceed. In some cases irrigators cross-furrow the lower quarter, third or half of the orchard.

The various forms of cross-furrowing or checking back are done exactly as when furrowing only one way, the necessary fills and cuts where furrows join being made with a small jump scraper or with a shovel.

The slopes given to furrows in southern California vary over a wide range, the soil texture and the size of stream's run necessarily being the governing factors. Sandy soils of course, require the greater slopes. Some advise planting trees on grades equalling the slope desired for the furrows; this is, substantially on contours. In the rolling foothill sections of southern California, especially in the younger orchards, this plan is quite largely followed. Where sidehills are steep terraces are not uncommon, and with their one tree row to the terrace are readily irrigated with one or more furrows and make a very attractive feature of an already attractive landscape. In ordinary soils some experienced growers consider a grade of 6 inches per 100 feet as a desirable maximum and advise contour planting and irrigation where necessary slopes with square or hexagonal planting, exceed that. But in this, as with nearly every other process of irrigation, practice must and usually does conform to the particular requirement of each orchard.

CONCLUSION.

Because the writer is unfamiliar, except by hearsay, with orchard irrigation conditions and needs in Western Canada, no attempt has been made in this paper directly to give advice as to the best practice to follow here. The purpose has been rather to familiarize you, by means of brief detailed descriptions and pictures, with the way some of the practical irrigation problems confronting you are dealt with in another western state. But by way of conclusion, it is desired to state a few of the principles California orchard irrigation practice seems to point to.

(1) No orchard can be well irrigated according to a book or a picture; such aids can only be suggestive. The first need is for each grower to know his own orchard below the surface as well as above it, especially as to the depth irrigation water percolates at different points in the furrows and as to the width of percolation from the furrows. A sharpened steel rod 6 feet long will indicate the depth of wetting while irrigation is under way, and an ordinary wood auger with the worm ground off, a 2-inch or 3-inch post hole auger costing $2 or $3, or a King soil tube, costing in the United States about $7.50, will, with little effort or expense, enable the intelligent irrigator to detect the need of moisture before irrigation or the extent and direction of percolation after irrigation.

(2) Excepting on very sandy soils, irrigation furrows 8 or 9 inches deep are invariably preferable to irrigation furrows 3 to 6 inches deep. The former facilitate deep percolation, which is desirable in most western soils, and prevent surface wetting, which is unqualifiedly bad practice.

(3) Irrigation furrows should not be so long that water runs more than an hour or so longer in the upper portion than in the lower portion. Flushing out the entire length of the furrows by using a double or triple stream in each furrow, when water is first turned into it, and until the entire length of the furrow is wetted, aids in even distribution. The tendency in good California practice is to cut furrow lengths down to 200 to 500 feet.

(4) The roots of most orchard trees under normal conditions, and where the trees are grown, reach throughout the space between the tree rows, and an irrigation is not thorough that does not likewise reach throughout that space. Boring 5 or 6 feet into the ground in different places in the irrigated orchard will show where the water has gone.

(5) A distinguishing characteristic of soils in western arid or semi-arid sections is that they greatly exceed the soils of humid sections in the amount of soluble plant foods they contain. Excessive irrigations, expecially it would seem by flooding, must eventually wash the soluble matter to lower depths where largely unavailable, as they have been washed by rains in humid sections. This is only one of many evils of over watering.

(6) The best distributing system of returns from an orchard will justify is a first requisite to good irrigation practice, for, to apply an old thought to a new theme, an orchard with water well distributed is half irrigated.

(7) The best irrigators do not seek a method of irrigating that will reduce labour to an unreasonable minimum. Labour intelligently applied to the application of water to an orchard soil represents money well spent. An orchard that

will not yield enough to pay for careful irrigation is not likely to persist. In the long run it certainly will not be profitable. (Applause.)

TUESDAY MORNING SESSION, AUGUST 18, 9.30.

CHAIRMAN: The meeting will please come to order. The secretary has a letter to read to the convention. The following letter was thereupon read:—

ASSOCIATED BOARDS OF TRADE OF
EASTERN BRITISH COLUMBIA.
OFFICE OF THE PRESIDENT,
NELSON, B.C., August 13, 1914.

EDGAR W. DYNES, Esq.,
Local Secretary, W.C.I.A.,
Penticton, B.C.

DEAR Mr. DYNES,—I have refrained from accepting the kind invitation you extended to me to be present at the convention to be held in your city on the 17th to 19th of August, not knowing for certain if I should be personally able to attend—this pleasure, I regret to say, I have to forego. I regret my inability to be with you, but desire to wish you a successful meeting.

Yours faithfully,

FRED. H. STARKEY.

CHAIRMAN: The first item on the programme this morning is an address by Mr. J. W. Eastham, Provincial Pathologist, British Columbia Government. His subject is

MOISTURE CONDITIONS IN RELATION TO PLANT DISEASES.

Mr. EASTHAM: Mr. Chairman, ladies and gentlemen,—The diseases which affect plants are of two kinds. On the one hand we have those which are due to parasitic organisms which live and grow in, or on, the tissues of the host plant and produce injuries of varying extent and degree. This may vary from nothing worse than a slight swelling (hypertrophy) of the part attacked, up to total death of large areas of the whole plant. These we may term parasitic diseases or diseases due to the presence of a parasite. On the other hand we have a class of injuries which are not due to the agency of such organisms but to some disturbance in the internal processes of the plant, and resulting, primarily, from varying external conditions of moisture, temperature, food materials, etc. Some workers would restrict the use of the term "disease" to the effect of parasitic organisms, and not apply it at all to the conditions brought about by variations in these latter factors, and indeed it is hard to draw a line between those results of variations in conditions which can be termed "disease" and those which cannot. An example will make this clearer. A plant which is exposed to a hot, dry atmosphere and, at the same time, insufficiently supplied

with water to its roots, will have its growth checked and, if the conditions are continued, will ultimately die. Such a plant, however, cannot be said to be diseased. In other cases, however, where the conditions do not affect the plant so unfavourably as to cause general death, we may find that certain parts of the leaves may be killed. We not infrequently find that the tips and margins of the leaves die and wither up, and that brown spots appear in those parts of the leaf furthest from the vein, and thus not as well supplied with water. Such effects may be observed on shade trees, especially maples, or orchard trees like the apple and the pear, and the common trouble of potatoes called "tip-burn" is of a somewhat similar nature. The cause of these injuries is essentially the loss of water from the cells, resulting in their death, but the effect is such as to be commonly termed, though hardly correctly, a "disease". In the case, however, of such apple troubles as "fruit" or "bitter-pit" and "water-core" we have definite and well characterized injuries produced as a result of certain conditions of growth together with, or influenced by, external conditions of moisture, temperature, etc. without the action of any parasite. Yet one can hardly refuse to consider "fruit-pit" and "water-core" diseases. It would seem almost as unreasonable to maintain that cancer in human being will not be a disease if it is finally established that it is not due to a parasitic organism. Without, therefore, defining a disease in any very precise way, we may use it for our purpose in its general and wide sense, and for further consideration we will classify diseases into two groups.

1. Parasitic—due to the injurious action of minute parasitic organisms, chiefly fungi and bacteria.

2. Physiological or Non-parasitic—due to disturbances in the natural internal processes or functions of the plant as a result of unsuitable external conditions.

Parasitic Diseases.—These are due mainly to two classes of organisms, fungi and bacteria. As a type of disease caused by the former we may take the common Scab or Black Spot on the apple, due to the fungus Venturia inaequalis. The first infection of the season occurs from minute spores produced in old leaves infected by the fungus last year, and kept moist at, or near, the surface of the soil. These spores are liberated about blossoming time, and carried by air currents to different parts of the tree, e.g., the flower stalks, leaves, etc. Each of these spores which falls on a young and tender portion of the tree may develop into a mycelium or fungus plant provided the conditions are right. One of the conditions, however, is a sufficient supply of water to enable the spore to germinate and produce an infection thread; this process will take at least twelve hours, and if a germinating spore should become dry before the germ has effected an entrance into the tissues of the host plant, it will be killed, and infection from it prevented. The amount of moisture present therefore on the tree at this stage, will largely determine the extent of infection, while repeated rains and humid atmosphere will intensify the effect, since the spores are not liberated all at once, but successively, for upwards of a month. In some cases almost the entire crop may be lost through the flower stalks being infected at this season and eaten away by the disease. The Mycelium at each infection spot will grow and develop and after a period of one to fourteen days, a crop of spores;

these will be scattered on the leaves, fruit, etc., and continue to spread the disease if conditions are right. Here again the presence of sufficient moisture is essential for the germination of the spores. With a dry season there will be little new infection, with wet weather infection may continue with susceptible varieties till comparatively late in the season. The relation between the prevalence of this disease and the rainfall is well seen by a study of its distribution in this province. In the Coast sections, scab is quite prevalent on apples and pears. In the Okanagan where the rainfall is ordinarily from 9 to 15 inches, it ceases to be troublesome in normal season, while in the Kootenays where the annual rainfall is greater, the disease reappears. Last year the season was unusually wet in the Okanagan district, and scab being unexpected, and measures not being taken against it, considerable damage from it resulted. I believe however, in most parts of the province, two sprayings are generally sufficient to control it, one a little before the blossoms open and one just after the petals fall, this is no doubt owing to the small rainfall during the summer, and is a striking contrast in, e.g., the Annapolis valley, Nova Scotia, where five or six sprayings may be required owing to the humid atmosphere, frequent rain and the presence of fogs. A case of somewhat different nature is found in the Peach Leaf Curl (*Exoascus deformans*). It is well known that a cold wet spring much increases the severity of this disease, so much so that many growers maintain that meteorological conditions are the sole cause. In this case, as in the preceding one, moisture is necessary for the germination of the spores, but the peach tree is only susceptible during one stage in its annual growth, namely, when the young leaves are just being exposed by the opening bud scales. Wet weather at this stage secures the conditions for the fungus to develop while if the spring is also cold and backward, as is very often the case when the weather is wet, the time taken for the buds to get through the susceptible stage is longer and therefore infection is likely to be much more severe. There is in this mount another rather interesting illustration of how moisture conditions may influence fungus infection. Here are two leaves of the common round-leaved mallow affected with Hollyhock Rust (*Puccinia malvacearum*). In the one case, the spore masses of the fungus are distributed over the entire surface of the leaf, in the other they are restricted to a few of the teeth along the leaf margin. Each of these spore-pustules probably represents a separate infection. When the infection is general, there was no doubt sufficient moisture present on the entire leaf to give the spores scattered on it a fair chance to develop. In the other instance, spores were probably present as in the former case, but only a few developed. We know that during the day there is much evaporation going on through the stomata of the leaves and a constant stream of water passing up the conducting system of the plant to replace this. With night fall the air cools more rapidly than the soil with the result that evaporation diminishes more rapidly than root-absorption. As a consequence the pressure in the vessels often becomes so great that small drops of water are forced out at the edge of the leaf close to where the vessels terminate. Such exuding drops of water have no doubt served to furnish the conditions of germination for spores of the rust and infection have taken place at these points.

The conditions for infection just given hold for most cases of fungus diseases, though there are just some exceptions, notably certain of the Powder Mildews which seem to thrive well and extend their infection rapidly even in very dry weather. In such cases there may be a perennial mycelium to serve as a starting point and probably also the spores germinate very rapidly On the whole, those districts where irrigation is required, but carried out judiciously, are very free from fungus diseases and if these were the only diseases to which crops are liable the lot of the grower in the dry belt would be a favoured one. As already mentioned, however, bacteria may also be the active agents in causing plant diseases and the way in which such diseases are spread is usually very different. Even the more delicate parts of land plants are generally covered by a thin but tough and resistant membrane, called the cuticle, and bacteria have usually no power of penetrating this, yet to cause disease they must enter the tissues of the plant and this can be only affected at the places where the cuticle is not developed or where it has been broken or injured in some way. In the former case infection may take place through the stomata, as in the case of Bean Blight (*Pseudomonas phaseoli*) through water pores as in the Black Rot of crucifers (*Pseudomonas campestria*) a method exactly comparable to that in the Hollyhock Rust specimens just shown or through the nectaries of the flower as in the Fire Blight (*Bacillus amylovorus*). Since Fire Blight is the most serious disease of orchards in British Columbia, at the present time it will be of interest to consider briefly how its development may be influenced by moisture conditions.

The starting point of the disease in the spring is the renewed activity of such bacteria as have been able to survive the winter in "hold-over" cankers. The evidence of this activity appears in the enlargement of the cankered areas and in the production of a gummy exude charged with bacteria. The exudate is the means by which the infection is carried to the blossoms but its amount and virulence are largely influenced by weather conditions. The amount of exudate, other things being equal, will depend upon the flow of sap, and therefore on soil moisture and temperature, but after it has begun to appear the atmosphere conditions may do much to diminish its powers of infection. The bacteria are carried to the blossoms by insects coming to suck the exudate. In a warm dry atmosphere it will dry up rapidly and when in a dry state offers little danger. Not only so but the bacteria are very sensitive to the action of bright sunlight. It has been demonstrated that where bacteria in a transparent medium are exposed to bright sunlight they are killed in four hours. We, see, then, why moist, cloudy weather is so favourable to blight infection, since the exudate remains liquid and virulent. After blight bacteria have been transferred to a blossom they multiply with great rapidity in the nectar and an insect subsequently visiting such a flower may carry the disease to many other blossoms. Weather conditions may have an influence on this phase of the disease where the germs are spread from blossom to blossom, but it is a little difficult to estimate it and I do not know of any actual observations or experiments on the subject. Dry weather will tend to dry up the infectious material adhering to an insect. Bright sunlight will also tend to kill such germs and to retard the development of them in the honey-glands. It is also known that dry weather at blossoming time decreases the amount of honey secreted, which in the case of an infected flower

Regatta at Penticton, B.C.

would mean less infected material, but on the other hand a bee would visit more flowers on any one trip and if it had previously become contaminated with disease germs it would possibly be able to infect more flowers. However, on the whole there is very little doubt that dry, sunny weather is unfavourable to the spread of the infection from blossom to blossom.

In the later stages when the bacteria have obtained entrance into the fruit spurs and twigs and the disease is actively running it is well known that atmospheric conditions have a marked effect on the progress of the disease; warm, moist, cloudy weather favouring it and bright dry weather checking it. Since most of the bacteria work near the surface of the twigs it is probable that the direct penetration of the rays of light into the tissues is sufficient to retard their activity. Sunlight also retards growth, making the tissues firmer and thus less easily invaded by the organisms, and stimulates transpiration so that the tissues are not so likely to be surcharged with sap. Weather conditions will have the same effect on new infections at this stage as in the first stage of the disease. Wet weather when the blight is running may much increase the difficulty of control work. The exudate may be washed on to other parts of the tree where the punctures of insects or abrasions of the bark, may afford good opportunities for fresh inoculations. In some seasons the cutting out of blight may in this way be rendered very unsatisfactory, since the disinfectant is rapidly washed off the cut surface and re-infection may then take place. Similarly in moist weather it is important to remove and destroy the cuttings from diseased trees as soon as possible and not let them lie under the trees as the infection may be carried back to the trees by insects. In hot, dry weather this is not nearly so urgently required, since the exudate and infected tissues rapidly dry up. From what has been said it will be seen that the atmospheric conditions which obtain in the irrigation areas of British Columbia are almost as unfavourable to blight as to fungus diseases, but yet the fact remains that Fire Blight is very destructive in these districts. There are, I think, three reasons for this:—

1. A considerable proportion of very susceptible varieties, such as Spitzenberg and Transcendent crabs, have been planted.
2. Most of the trees are young and the disease spreads more rapidly in them.
3. The progress of blight in a tree is more influenced by the sap contents of the tree than is the case with most fungus diseases; hence over-irrigation or forced growth may more than outbalance the effects of a dry atmosphere. The application of an excess of water may directly affect the multiplication of the bacteria and the consequent spread of the disease through the tissues. The bacteria live chiefly in the inter-cellular spaces, and one of the conditions of their multiplication is the presence of a sufficient quantity of moisture; the more the cells of the plant are overcharged with moisture, the more readily will this be obtained by the bacteria, while it is also probable that the dilution of the cell contents will diminish the resistance of the cells to the killing action of the germs. With an increased supply of water the activity of the bacteria often increases very noticeably. Fire Blight may be moving very slowly or be almost checked in late summer but after turning on the irrigation water,

the disease may once more become active again, at any rate in the more susceptible varieties.

It is a well known fact in the East that a cultivated, well-cared-for orchard, with trees making good growth, is much more likely to suffer through blight than one in sod where the trees are not making the same growth. The contrast is still greater where growth is forced by over-irrigation. In such trees the excess of water present favours the rapid multiplication and spread of the blight organisms in the tissues so that the disease progresses rapidly once the tissues have become invaded, but not only so but infection is also more readily produced. Where the tissues are comparatively dry and woody, bacteria introduced into a minute wound may dry out and die without giving rise to an infection, whereas in more succulent tissue there would be sufficient moisture to give the germs the necessary start. In the case of a tree which has been inadequately supplied with water and fertilizer, it is often difficult to get an artificial infection even with a vigorous culture of the blight bacillus, except in the early spring. The first growth of such a tree does not differ materially, however, from that of better-cared-for trees, and hence we may find infections taking place in the early growth although, owing to the rapid hardening of the tissues the disease soon dies out. In general, it may be said that the nearer the quantity of water applied approaches the minimum required for a reasonable amount of growth and the maturing of the crop, the more effectively will blight be controlled.

PHYSIOLOGICAL OR NON-PARASITIC DISEASES.

Diseases of this nature are amongst the most difficult to investigate since they do not depend on the presence of a definite organism, but on the balance being disturbed between the different processes going on in the plant; this again, is brought about usually by variations in the external conditions and as these do not usually vary one at a time it is often a difficult matter to estimate the relative importance of each.

Two of the best known diseases of this type are the Water Core and the Fruit-Pit, to which the apple crop in particular is liable.

Water Core well illustrates the fact that several conditions together may be necessary to bring about a disease. Healthy plant tissue consists of living cells which do not fit tightly to one another over their whole surface, but have numerous cavities between, which communicate with one another. Ordinarily these cavities are filled with air, forming as it were, a breathing system for the cells. If the sap-pressure in the cells becomes too great, water is forced into the air spaces until the entire inter-cellular space in a given area is filled with water instead of air. This is exactly what happens in Water Core, the glassy, water soaked appearance of the tissues being due to the replacement of air by watery sap, while, if the disease is very bad, quantities of liquid may be forced into the seed-cavities, which has led to the name "Water Core."

The work of Mr. P. J. O'Gara has shown very clearly the associated conditions which may give rise to Water Core. The three most important ones are:

1. High water-content of the soil. In particular, heavy rainfall, or irrigation just before the fruit is mature. This provides the water supply for a rapid flow of sap.

2. Clear bright weather with high temperature during the day. This promotes active transpiration.

3. Marked difference between the day and night temperatures. This is the decisive factor. It is apparently not unusual for the difference between the maximum and minimum temperature during the twenty-four hours to be 40° F., or more. The result of this fall in temperature is to bring the air nearer to saturation point and thus greatly check the loss of moisture from the leaves and fruit. At the same time the temperature of the soil does not fall so rapidly and the roots continue to actively force water up into the tree. Evaporation being checked, the internal pressure of the sap gradually increases, and since the cells in the maturing fruit are less resistant, sap is ultimately forced out into the air spaces, which is the beginning of water-core. With repetition of the same conditions the disease becomes gradually worse.

The active cause then, of this disease is a wide difference between the day and night temperatures, while an essential condition is a plentiful supply of moisture in the soil, excessive irrigation or precipitation, when the fruit is ripening particularly favouring the disease.

Fruit Pit, also called Bitter Pit and Baldwin Spot, is probably sufficiently well known to those present to render any description of it unnecessary. An address on the subject was also given at the Irrigation Convention at Kelowna in 1912, by Mr. M. L. Dean, in which our knowledge of the control of the disease was practically summed up in the statement that "the system which promotes a uniform normal growth of tree and fruit throughout the entire season is the best antidote."

This perhaps, does not sound very definite, but, from the nature of the disease, it seems very unlikely that anything in the nature of a specific for it will ever be obtained. In Australia the disease is of such consequence that in 1911 Mr. D. McAlpine, one of the foremost plant pathologists in the English-speaking world, was appointed by the Commonwealth Government to give his whole attention to the disease for a number of years, or until a solution of the problem has been obtained. Two progress reports have been published but, owing to the complexity of the problem and the number of factors which may affect it, no great addition has yet been made to our powers of controlling the disease on the tree. It is known, however, that the relation of moisture to the disease is an importamt one and that the character of the season has much to do with the prevalence of the disease. Drought is commonly considered to be one of the main causes, but this cannot be the only one or we should not find it serious on properly irrigated land. It is much more likely that marked fluctuations in the available water supply, resulting in a spasmodic growth of the fruit, are to blame. Mr. McAlpine has made a very careful study of the conducting system by which the sap is distributed through the apple fruit. Towards the outside of the fruit this forms a network of innumerable small meshes. The regularity of this network is largely dependent upon a regular and not too rapid growth. Should there be an excess of sap and a forced growth at certain times while the

fruit is developing, some of the meshes of this network will either not be formed or will be broken down. As a consequence certain masses of cells are very unfavourably situated later on for obtaining a sufficient supply of moisture, and, as a consequence, they die and form the pitted spots. It is probable that a certain amount of irregularity in the manner of growth is inseparably connected with irrigation, but there is no question that whatever tends to keep the moisture content of the soil uniform will tend to diminish Bitter Pit. (Applause.)

CHAIRMAN: We can now devote some time to discussion, if there are any points you would like to bring up or questions you may wish to ask.

Mr. HOOKER: With respect to Fire Blight, it has been advocated that bees be kept in an orchard. I would be interested to know your opinion as to the advisability where there is danger of blight, of keeping bees in connection with the possible spread of Fire Blight.

Mr. EASTHAM: The bee is simply an agent in the transmission of the disease. Provided the cankers are cut out in the winter time, there will be very little exudate to be carried by the bees. The bees are almost essential for the proper pollenation of the blossom. I don't know of any observations which show there is a relation between the prevalence of Fire Blight and the number of bees. I think emphasis should be laid upon cutting out all dormant cankers.

Mr. BULMAN: With regard to Water Core, I should like to know whether there is any hereditary tendency in trees of the same variety?

Mr. EASTHAM: I don't know that I have any data with regard to the comparative prevalence of Water Core in the same variety, but there is a very marked difference in different varieties and there is also quite a difference in the condition of the tree. A tree growing rapidly and having a large amount of sap would be more likely to have Water Core than one growing slowly; also one with a light crop would be more likely to have Water Core than one with a heavy crop.

Mr. TAYLOR: Have you any information about experiments carried out in Washington regarding the time bacteria will live after the branches are cut off? I understand that after being a fortnight on the ground in the sun, they became active after the branches had been put in water.

Mr. EASTHAM: If the bacteria get completely dried out, they will not retain their activity for more than nine or ten days. If the branches are left in an orchard, complete drying out does not always take place. Recent work has shown that bacteria are more retentive of life than hitherto supposed. Experiments were made with small blighted twigs which remained on the tree over winter till March and living bacteria were isolated from those.

CHAIRMAN: Before calling on the next speaker, we shall take this opportunity to ask Mayor Jones, of Kelowna, to make an announcement and give some explanations in regard to the details of the motor trip to-morrow.

Mayor JONES: Mr. Chairman, ladies and gentlemen,—Two years ago we had the pleasure of welcoming the irrigation convention to Kelowna, and the conclusion of the proceedings you came down to finish up at Penticton, by enjoying a splendid banquet tendered by the citizens. The closing expression of that convention I think was a very happy one, and it gives me great pleasure to meet you again. I think the splendid hospitality that has been shown by the people of Penticton and their magnificent greeting has demonstrated that your presence is greatly appreciated. We recognize that many of you have come from far away, and wish to entertain you to the best of our ability. Many of you come to us from the South, others from the western Prairie Provinces, so the people of Kelowna have commissioned me to extend to you a hearty invitation to stop off on your trip out of the valley. The steamer will stop at Kelowna at half-past eight for two hours. We have over one hundred automobiles to be placed at your service, and during that time will give you a drive through our many orchards and through our district, and will endeavour to show you something of one of the best fruit growing districts of the Okanagan valley. You have tested the quality of the Penticton peach, and we would like you to see if the Kelowna peach is its equal. We want to show you the largest onion and tomato patch in British Columbia and then the largest fruit-canning factory in British Columbia, and then we think we will be able to send you off feeling that the people of the Okanagan are no small fry. We will be very pleased if this Convention will let us know about how many can stop off, and we guarantee to get you back in time.

Mr. TAYLOR: May I make an announcement about Kelowna. There will be a meeting of the British Columbia Entomological Society at Kelowna on Thursday. We specially fixed the date in order that we might try and catch the entomologists and those interested who are here at this meeting. This meeting will deal entirely with the practical side of entomology as it concerns the fruit grower. It is an innovation, made last year. We had a very successful meeting last year in Vernon, about forty-five people attending, including one or two gentlemen from the States, who gave us very valuable assistance. The meeting is on Thursday next, at ten o'clock, at Kelowna.

CHAIRMAN: Any of us who were at Kelowna two years ago will have a very vivid remembrance of the way the Kelowna people can entertain and any of the delegates who can possibly take advantage of this motor trip should certainly do so. Mr. Dynes will explain.

The local secretary then stated that a telegram had been received from Mr. H. W. Brodie, the C.P.R. General Passenger Agent, Vancouver, to the effect that the Okanagan would be tied up for the convenience of the delegates during their stop at Kelowna, and delegates wishing to go expressed their thanks for the invitation of Kelowna by a standing vote. The local secretary also announced that photographers wished to secure photographs of the Convention at the conclusion of the session.

Mr. CRANDALL: Mr. Chairman,—It seems to me in connection with that, that there ought to be included an expression of thanks to be sent by our secretary to Mr. Brodie, and I would like to move that it is the expression of those who are experiencing the kindness of these arrangements that we convey to Mr. Brodie our thanks for the courtesy he is extending.

CHAIRMAN: The Secreatry will embody that. The next speaker will be Professor W. J. Elliott, Principal of the Provincial Agricultural School, Olds, Alberta, who is to talk to us on the matter of

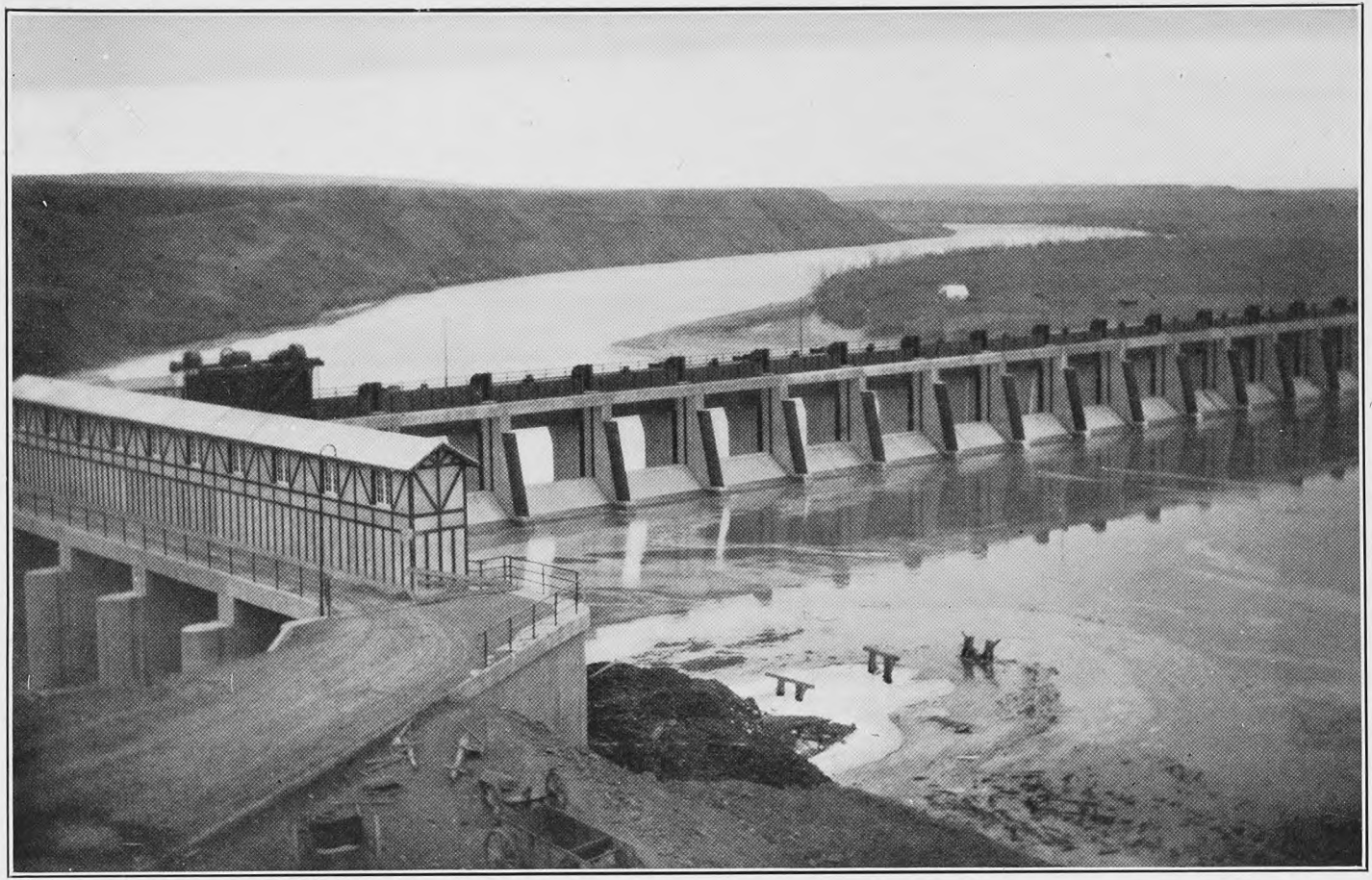
EDUCATING THE FARMER'S BOY AND GIRL.

Prof. W. J. ELLIOTT: Mr. President, ladies and gentlemen,—Every once in a while the privilege is given to some keen thinker of bringing forth a new idea, and then everyone wonders why the idea was not thought out long ago, because it is so logically the common-sense thing. Such an idea came to the Hon. Duncan Marshall, Minister of Agriculture for the province of Alberta. Those who know Mr. Marshall will realize that he has, perhaps above everything else, a thoroughly practical knowledge of the thousand and one details of his very important agricultural branch. It suddenly occurred to him one day that if the lawyer had his own school, the doctor his school, the civil engineer his school, the school-teacher his school, then why not a school for the young man who is going to farm? Agriculture is the most important calling of all. It is the only real source of wealth, and if Canada is so utterly dependent upon the man on the land, then why not a school where he may learn a little bit more about the business that is to be his for life?

On first thought it might be claimed that the agricultural colleges are doing this thing, but we believe that a careful survey of actual conditions will reveal the fact that a large percentage of the graduates of our agricultural colleges prefer to go into professional life rather than to return to the farm. We, of course, do not criticize the colleges for this fact, for there is certainly a demand for professional men along many lines of agricultural endeavour. Nor do we blame the young man who, after graduation, finds some useful line of work that calls him off the farm. The fact remains, however, that many of our college graduates do leave the farm. Now, Alberta's farm schools which come directly under the Minister of Agriculture, are taking up the problem of helping the farmer's boy to help himself in a new way.

MANY FARM BOYS LACK EDUCATION.

It is a fact that in Alberta there are many young men who came to the new land of the West with their parents at a time when there were few schools, and at a time when the family purse was not stout enough to employ hired help. Thus the boy got very little or possibly no public school training after coming to the province. These facts are to be regretted, yet they are part of the price that is paid by the "pioneer boys" who give their lives to help their parents win a home for themselves.



Canadian Pacific Railway Company's Dam, Bassano, Alberta.

Alberta, like the rest of the provinces of this new Dominion, has literally thousands of boys who are to be our future farmers, and who are deficient as far as the public school standard is concerned. These boys range from 16 to 25 years of age. They will not go to the public school even though later financial success would make this possible.

We could not expect a boy of 20 years of age to stand in a class at the public school with a ten year old boy in knee pants. Then where can he go ? The high school standards will not admit him; the college hold their standards of admission above his head. The facts are, then, that the man who is to become the tiller of the soil and on whose shoulders the burden of Canada's prosperity must rest, will have to do without training. No, that will not be the case in Alberta.

ALBERTA'S SCHOOLS.

The Minister of Agriculture has established three schools of agriculture in the province that are primarily for the farmer's boy—for the boy who is to be the future farmer of the province. These schools belong to him. He has a right to go to them, and at them he meets others just like himself. There are no standards of admission, the only thing being a willingness and a conscientious effort to do on the part of the boy. The atmosphere of the school is an agricultural atmosphere, the instructors have the word "practical" written high and clear above every lesson that is taught. The idea of the education is first, to give the boy a clear view of the importance of his calling, so that he may grasp the idea that every business on the face of the earth comes second to that of agriculture. And, in the second place, the school seeks to give such information as will be useful to the boy as soon as he returns home. No lesson is given in the classroom that is not immediately followed by practical work in the laboratory, the stock-judging room, the seed testing room or the blacksmith and carpentry shop.

THE COURSE OF STUDY.

Prime importance is given to live stock, as the permanent success of western agriculture is wrapped up in this. The boys are taught to judge draft horses, dairy and beef cattle, the various types of hogs, etc., and while these animals are being discussed, matters are taken up with regard to the various Alberta feeds that are available and suitable. Next in importance to the live stock work comes the work of grain judging, weed seed identification and a thorough discussion of Alberta's soils and how to handle them. The iron and wood repair work is another very important phase of the education. A carpentry and blacksmith's shop have been provided and all kinds of farm repairing work is done by the boys. They are first taught the use of both iron and wood tools, the care of a forge and fire, etc. The boys make door hooks and chains, make clevices, whiffle-trees, wheel barrows, and wagon boxes. This includes the cutting out and making the woodwork and the making and shaping of all irons for the same.

In addition to the above, the boys are given a thorough course in business English, and work in chemistry, physics, botany and such subjects as are directly

and closely related to agriculture. For instance, the boys are shown the cattle fed on the farm and learn that they receive certain proportions of oats and barley, cut-oat bundles and wild hay, The boys then go to the classroom and an instructor in chemistry shows them the same oats, barley and roughage. The chemical composition of each is discussed in terms of feeding cattle. The boy learns that to put fat on animals he must feed the starchy foods like barley and wheat, and that to produce milk the oat is the grain that is used above all others. In this way, the discussion of the composition of the feeds on the farm is so interwoven with the actual work that is going on on the Demonstration Farm that he becomes familiar with the ordinary feeds on an Alberta farm: and, without knowing it, is actually studying the chemistry of cattle feeding. It is just in ways of this kind that all of the lecture work of the classroom is made of actual value to the boy in a practical way.

ARE THE SCHOOLS WELL ATTENDED?

The natural question to ask is, "How were the schools of agriculture received by the farmers and the farmers' sons ?" When the principals were appointed and the staffs were being called together last fall, the Minister of Agriculture suggested that if fifteen to twenty boys were received at each school, he would be entirely satisfied. The schools have certainly been appreciated by the farmer and the attendance of the boys has proven beyond the question of a doubt that these are the schools that the farmers want for the education of their boys.

In the three schools, 176 boys were enrolled for agricultural instruction. We doubt if there is a province or state on this continent that can show such a record. One hundred per-cent of the boys came directly from the farms. In this way it will be clearly seen that the agricultural schools are not encroaching upon the work of the public schools or collegiate institutes. They have drawn their students from a class of boys who heretofore have received no instruction. At the Olds school, thirty seven boys were registered the first day, and inside of two weeks a total of sixty-one boys were admitted. More seats had to be ordered and more equipment secured. Before Christmas the principals of the schools were advising the farmers not to send any more boys, as the schools had practically all that they could possibly handle.

Present indications would suggest that there will be in the neighbourhood of 260 boys at these three schools next winter. The school term only runs for five months in the winter, beginning October 27, and lasting until the end of March. At the present writing, the Olds school alone has received signed up applications from forty-two boys and eighteen girls from last year's class who wish to take a second year; and, in addition, thirty-three boys and six girls have registered for the first year. This makes a total of ninety-nine registered for next year's work at the Olds school alone. Indications are that by the time of the opening day the school will be refusing to register any more students. Indeed, the schools are regarded so highly by the farming communities that the Minister of Agriculture is literally besieged with delegations asking that additional schools be established at other points in the province.

HOUSEHOLD SCIENCE BRANCH.

In addition to the work that is given for farm boys, a course is offered in household science for the farmers' daughters. The course is not limited to farmers' daughters, because girls from the surrounding towns as well are taking advantage of the same. This branch covers a study of foods, sewing, cooking, laundry work, hygiene, sanitation, home care of the sick, and work in home gardening, poultry and butter making. Here again the work is made as practical as possible. Somewhat of an idea may be gained of the practical nature of the work when it is said that Mr. Pat Burns, the noted cattleman and packer of Western Canada, after going through the buildings, and seeing the boys and girls at work, declared that it was the most practical institution he had ever visited and offered on the spot $100 scholarships for the best stock judge, for the best grain and weed seed judge, for the best cook and the best lady sewer.

So apparent is the usefulness of the schools that already the Minister of Agriculture is planning large extensions in the way of buildings to accommodate next year's quota of students.

ADVANCED AGRICULTURAL COURSE.

It will be seen by the foregoing that the course as offered by the Alberta Schools of Agriculture is designed particularly for the boy who is going back on the farm. There, of course, will be a small percentage of students who wish to go on for more advanced work. The Schools of Agriculture, therefore, fit in with a regular continuous system of agricultural education in the province. The two years as given at the schools are about equivalent to the two years offered by Guelph and Manitoba agricultural colleges, with particular adaptation to western conditions. Students who complete the two years' course at one of the provincial schools will be admitted directly into an advanced degree course as offered by the Provincial University.

EXTENSION WORK.

The staff at each school is composed of thoroughly practical men, and during the seven months of summer when the school is not in session, these men devote their entire time to agricultural extension work. In short, this extension work may be said to cover any practical assistance to the farmers in the district covered by each school. It is needless to say that a good deal of this extension work is carried on through the farmers' sons who attend the school during the winter. The animal husbandry instructor has outlined a series of experiments to be conducted by twenty of the students along the lines of the summer feeding of hogs.

The agronomy instructor has an experiment outlined in connection with alfalfa, and approximately twenty of the students will undertake this experiment.

In addition to this, the students of the school have formed an experimental union, and under this union, a great many varieties of grains and grasses will

be tested out. The agronomy instructor of the school is the secretary of the union and will be in a position to give practical advice at all times.

COW-TESTING ASSOCIATIONS.

Cow-testing Associations are being started, and so great is the call for assistance in this line, that it will require the balance of the staff to visit the students and farmers once per month to weigh and test the milk of the cows that are entered in the cow-testing association. It is an interesting fact to note that twenty of the boys of the school and eleven of the girls have signified their intention of keeping the records of the herds at home, with a view to securing the advantage of the cow-testing association. It will thus be seen that the staff are kept directly in touch with the farming community surrounding each school.

CO-OPERATION WITH DEMONSTRATION FARMS.

A point that might be brought out in this connection is with reference to the co-operation between the Government demonstration farms and the schools of agriculture. The schools of agriculture occupy twenty acres of land on the corner of the demonstration farms. The balance of the land is handled under the direction of the Superintendent of Demonstration Farms, who conducts each farm as a more or less commercial proposition. Herds of dairy cows representing the various breeds and including milking shorthorns are found on each demonstration farm, and milk of superior quality is shipped to large centres like Calgary and Edmonton. The demonstration farms are not handled entirely in the way of experiment stations, but rather follow out the experiments of the various stations and test the grains, grasses, etc., in a commercial way. It is an interesting point to note that these demonstration farms are paying their own way, a thing that is perhaps very unusual with demonstration farms in the Dominion of Canada.

The students thus have a demonstration farm at all times run along ordinary farm lines and operated as a paying proposition. The instruction gained by observing the work as it is carried on is thus made all the more valuable. The manager of the demonstration farm gives instructions to the boys under the heading "Farm Management" and, needless to say, his talks are borne out by the actual work on the farm.

ECONOMY OF EQUIPMENT.

The school of agriculture does not need to carry an expensive equipment in the way of the various classes of stock for educational purposes. The stock that is used for judging purposes is just the ordinary stock that is carried on the demonstration farm. A team of horses may be drawing straw, ice, hay, grain or anything on the farm, and at noon the harness is taken off them and they are sent to the stock judging room for the use of the students. In this way, the operation of the schools of agriculture is very much less expensive than it otherwise would be.

It might be added that of the twenty acres under the supervision of the schools of agriculture, about fifteen are set aside for experimental plots, where the various classes of grain, grasses, shade trees, shrubs, fruits and berries, are tested out in the interests of the farming community. All those who visit the demonstration farms and the schools of agriculture are high in their praise of the practical nature of the work that is given to the students and of the useful information and help that is available for the farmers living within the district covered by one of Alberta's schools of agriculture. (Applause.)

CHAIRMAN: There is one item I think Professor Elliott omitted and that is, the amount of the fees for the course.

Professor ELLIOTT: I said that the school is handled by the Minister of Agriculture and so is entirely free. There are no fees of any kind in connection with the school. The school provides all wood, all ironwork and everything in the household science department. It will cost us next year one thousand dollars to buy iron, wood and equipment. The boys must provide their board and room while attending, which averages four and a half to five dollars a week. The books cost, perhaps, five to six dollars. Each student is asked to deposit five dollars as caution money. We give them an equipment to work with during the term. This amount covers breakage or loss during the year and is returned if nothing is broken or lost.

Mr. RANKIN: I understand, Professor, these students do not live in the college. Might I ask how you control them; how you keep a check on them?

Professor ELLIOTT: We have no dormitory in connection with the school: that may come later on. Every home where the students board must register with me. I have a registration of every home and I get weekly reports from those homes with regard to every student. If he is found not attending, he is immediately sent home, because the school will be crammed to the doors anyway, and the boys know that. I want to tell you this though, gentlemen, if you will pick up a hundred boys from the farms of anyone of the western provinces, you have got a pretty decent lot of boys. (Hear, hear.) In all the work I have ever done, I have never met a class of boys I have had as little trouble with as the boys and girls at the Olds School of Agriculture. We have a students' government and the boys elect their own president and cabinet, in which all branches of the school are represented, and matters of discipline are turned over to the cabinet to deal with.

Mr. RANKIN: How many have been expelled?

Professor ELLIOTT: We caused one to be expelled last year for drinking. That is something we will not allow under any circumstances. (Applause.) We go so far as to prohibit smoking on the campus or in the building. (Applause.) The boys and girls are required to attend the church of their choice once each Sunday, and all these things have a mighty wholesome effect on a

student body. Last year we had only the one case of a boy sent home for the one thing we will not stand for above everything else, and the other two principals will say the same thing.

Mr. Donald Cameron: There was one thing I did not hear very much about in connection with manual work, which is daily receiving more recognition and would constitute what Mr. Smith might call diversified education. There is one notable case that is not very well known where it was suggested that the boys receive so many days a week of manual training. At that time the girls were ahead of the boys as they usually are at that time of life and the governors were quite prepared to find the boys would still drop further back, but to their amazement they found them ahead of the girls after they had been spending so much extra time in this way. The girls then received the same opportunities and soon regained their position. It shows that if boys are taught in that way, it is a great help to them. The subject must be taught so that the boy takes pleasure in it. I should like to know if he is taught book keeping?

Professor Elliott: We have had Mr. F. M. Black, Chief Accountant for the Pat Burns Company, Calgary, and Mr. James Elliott, Private Secretary to Doctor Rutherford, prepare a practical system of book-keeping for our boys. The chief difficulty with book-keeping systems is, that they are too elaborate. We are having a system devised just as simple and practical as it can possibly be, so that the boys may have an idea at the end of the year just where he stands in connection with his work. That work is taught, sir. We also have social features which we control ourselves. From our school last year we sent a debating team out that went up to the semi-finals of the province—farm boys who had neglected their education, who were enabled to carry the team up to the semi-finals of high schools. (Applause.)

Chairman: Mr. H. W. Grunsky, of the Water Rights Branch of the British Columbia Government, will now address the convention on the subject.

FEATURES OF THE BRITISH COLUMBIA WATER ACT

Mr. W. H. Grunsky: Mr. Chairman, ladies and gentlemen,—In comparison with the water legislation of other western states and provinces, the Water Act of British Columbia holds a unique position. It can be said without fear of contradiction, that in the legislation of no single state or province is there found a code dealing with all the various uses of water whose parts are so well co-related or whose character stands so consistently for advanced conservation principles as the Water Act of British Columbia.

The act is practically a product of the past twenty years. From the time when the first settlers came to these far western shores in quest of gold and other precious metals, a few brief clauses were put into the statute books and rules were adopted governing the acquisition of "ditch privileges" as they were called. These same clauses and rules formed the nucleus around which were developed the later Water Acts, yet they were framed to meet the needs of a

J. A. Cammaert's irrigated alfalfa, 2nd cutting, August 5, 1914, Strathmore, Alberta.

more or less unstable mining community, and were not at all suited to the exacting requirements of modern times.

The task of consolidating into one unified Act all the various clauses pertaining to the use of water was begun in 1897. Prior to this time, a man desiring a water right could simply walk into the Government office and cause a record to be made in his favour for almost any quantity of water he might name, regardless of whether the stream was capable of supplying such quantity; and regardless of whether the applicant could show that he could beneficially use such quantity on his particular land or mine, or in respect of his particular undertaking.

There were already at this time thousands of old records in existence, many of which had been imperfectly issued, throwing doubt upon the validity and extent of existing water titles.

In the Consolidated Act of 1897, the principle of making every right depend upon continuous beneficial use was strongly expressed, and water recorders were given power to cancel records for non-use.

The procedure adopted in this Act, however, did not produce the results expected; and in 1909, under the capable leadership of the then Minister of Lands, the Hon. F. J. Fulton, an Act was passed, which for the first time met the issue squarely. A board was created which should devote its entire time to the investigation and determination of rights held under the old records. The procedure of granting new rights was also revised and improved.

The scope and fundamental principles of the Act of 1909 have not been materially altered by amendments passed in the years 1910 to 1913, the principal change made in these years being such as were suggested in the course of administration and as seemed necessary to the proper working of the Act.

Coming now to the "Water Act of 1914," in the brief time at my disposal, it will be impossible to discuss more than a few of its main features; but if, in going over these few points, I can impress upon the members present something of the spirit of the Act, and of the relative position which it holds among the water Acts of other western jurisdictions, I shall feel amply repaid.

There are two main parts to the new Act: nearly one-half dealing with companies, associations, and bodies corporate, which may be formed for the carriage of storage of water, including public irrigation corporations. The other half is the old Water Act with its amendments consolidated and revised. Incidentally, I may say that in revising the old Act, it was reduced in size about twenty per cent.

As there is already some published matter dealing with public irrigation corporations[1]; and as that part of the Act is not of such wide application in the province as the Water Act proper, I will confine my attention this afternoon to the general features of the Water Act proper.

ADMINISTRATION.

The administration of the waters in British Columbia is shared by the Minister of Lands, the Comptroller of Water Rights, the Engineers of the Water Districts, and the Board of Investigation.

[1] "Report on a Public Irrigation Corporation Bill" by H. W. Grunsky. Copies may be had by addressing the Comptroller of Water Rights, Victoria B.C.

The Comptroller is the Administrator-in-Chief of the Water Rights Branch. He receives applications, examines and approves plans, issues water licenses, and generally passes upon all matters of an engineering nature. He has authority over the engineers of the water districts, who directly supervise the distribution and use of water and from whose every decision there is an appeal to him. There is likewise an appeal from the Comptroller to the Minister whose decision is final.[2] The Comptroller is ex-officio a member of the Board for all purposes except the adjudication of rights held under old records.

The Board of Investigation, whose sole duty under the 1909 Act consisted in investigating and adjudicating upon old records, has had its sphere of action considerably enlarged under the later Acts. Matters pertaining to the amendment of licenses which have been imperfectly issued, and generally such other matters as affect the title of the licenses come before the board. There is an appeal from its decision on these matters directly to the Court of Appeal of the province. Then there is another class of matters respecting the operation of licensees who are engaged in making a profit from the barter and sale or the carriage of water or power which come before the board with an appeal directly from its decision to the Minister.

Up to 1912 water-licenses in British Columbia, like the old records, could be issued by the local water commissioners. This plan did not work well and in that year an important change was made. While certain preliminary proceedings, such as posting notices, advertising, filing objections and so on, were still to be carried on at local points and while the hearing on the application might still be held locally before the water recorder or some person appointed by the Minister, the actual decision on the application was to be made by the Comptroller and license issued by him.

This centralization of the administration governing the acquisition of rights was a big step in advance over the old method. It insured uniformity and accuracy in the records; it also insured that the granting of a water privilege, no matter where located, and no matter whether large or small, could only be accomplished after the careful investigation and comparison by the Comptroller himself.

DISTRICT ENGINEERS.

While there must be central authority to deal with the granting of licenses and with the larger legal and engineering phases of the water question, it is very clear that if a close supervision over water diversions is to be exercised, there must be a local arm of the water branch in every important district in the Province. If a difficulty arises between water users there must be an engineer near at hand, who is capable of settling the difficulty. Prior to the last year the only officials representing the Water Rights Branch locally were the "water recorders." These water recorders, however, were primarily office men and had

[2]Colorado also permits an appeal from the decisions of the district engineer to the state engineer. Revised Statutes, Colorado, 1908, s. 3433. Oregon and Wyoming permit an appeal from decisions of the state engineer to the Board, and, in case of Wyoming, a further appeal may be carried from the Board to the Courts. Statutes of Wyoming, 1910, s. 733 and 779. Oregon Laws 1909, c. 216, p. 333, s. 49, Do, s. 51, Do., p. 326 s. 26, being sections 6627, 6631 and 6650 of Title XLIII. Lord's Oregon Laws.

no technical training in water matters, so the system failed to give satisfaction. Under the present Act all this is changed; the district engineers now have their headquarters at local points. The result has been most gratifying; streams are being measured, the central office is being kept in touch with local conditions in every part of the province, while on the other hand, licensees are learning something of the aims of the Water Rights Branch; water troubles are being gradually dissipated and there is a better feeling everywhere.

UNIFORMITY OF PROCEDURE.

Under the present Act there is just one chapter on the procedure for obtaining a water license, and that covers the steps to be taken by every applicant, no matter whether the water is to be used for domestic consumption, for the irrigation of land, for the development of power, for the floating of logs, or for some other use. A little variation is made here and there to suit the special needs of applications for each purpose, but the main variation depends whether the use to be made is large or small, and upon whether the applicant is to use the water or power upon his own land or is to engage in the business of sale to others.

The steps required may be briefly summarized:—First, the applicant must post notices in conspicuous places in the locality where the water is to be taken and used; next, he must, without loss of time, file a similiar notice in a local Government office, and, in the most cases, must publish it in a newspaper circullating in the locality; then, within a brief time, the application proper, accompanied by a sketch, must be filed in duplicate in the local Government office. One copy of this application and sketch goes to the Comptroller, who notifies the applicant by letter of any further information which is required to put his application in good standing. Ample time is allowed for the filing of objections by interested persons, and a hearing is held, if necessary; then, if detail plans are considered necessary, the Comptroller may grant an authorization to make surveys, and within a stated time the requisite plans must be filed. The Comptroller examines the plans and, if satisfactory, approves them and issues the conditional license.

The conditional license is really an authorization to construct works and licenses to use water pending the time when the works shall be completed. Suitable procedure is afforded for the taking of such lands as may be necessary for the construction of works.[1] The application is held down to a definite time within which he must commence construction and bring the works to completion. To protect settlers whose lands are covered with timber it is held that the clearing of lands is made equivalent to a commencement of works.

The time given for the completion of the works is usually liberal but can only be extended if the applicant satisfies the Comptroller by statutory declarations that he has begun and diligently continued the work in good faith and has been prevented by causes beyond his control from completing it and making beneficial use of the water.

When the applicant makes his declaration of completion of the works (supported by the declaration of at least one credible witness), the Comptroller

[1]See the definition of "works" section 3.

either in person or through one of his engineering staff, makes an inspection and if he finds everything satisfactory a final license or water patent is issued, giving a right to the extent to which beneficial use has been made of the water and no more.

SMALL APPLICATIONS FACILITATED.

It is very plain that the applicant whose contemplated use of water is relatively small (called under the Act a "Class A" applicant) cannot be expected to fulfil the same requirements as an applicant for a larger privilege. Therefore the Act provides that in such case the Comptroller need not call for surveys or detail plans, but may, after the time for filing objections has expired and after being satisfied that there are no valid objections to the application, grant a license to the applicant forthwith. The application it will be noted is in all cases accompanied by a sketch or plan, but this sketch or plan need not necessarily be drawn to a scale.

In the matter of publication the smaller applicant is also favoured, the Comptroller is allowed to grant dispensation from advertising when the application is for mining purposes for not more than eight cubic feet per second or for domestic purposes and not more than 500 gallons per day, if he is satisfied that all parties whose interests might be prejudicially affected have had actual notice.

PUBLICITY.

In no other jurisdiction, I think, is the same amount of publicity required of intending applicants for water rights as in British Columbia. This may, in some cases and for the time being, work slight hardship upon certain applicants; but it satisfies the public and makes for good administration and in consequence there is no such thing as getting away with a water license in the dark in British Columbia. As already shown, the tendency of recent Acts has been to lessen somewhat the amount of advertising required of the smaller applicants.

The states of Wyoming and Oregon require no advertising at all, leaving it to the state engineer to discover, unaided, what objections, if any, there are to an application. Idaho follows the same course, but compels the applicant to advertise when he has completed his works and is ready to make his final proofs.[1] This seems a good deal like locking the barn door after the horse is stolen. The time for the Government to be on its guard and to hear all the pros and cons on an application is, it seems to me, before the applicant has been allowed to construct works of a permanent character.

CLASS "C" WATER PRIVILEGES.

The method adopted for protecting the public interest in the larger water and water power privileges is a most important point in any Water Act. What special requirements if any are made of applicants proposing to engage in the sale, barter, and exchange of water or of water power? Such privileges are

[1]Civil Code, section 3257, 3260, being Laws 1903, 223, ss. 4, 7.

quite different from grants for the use of water upon applicants' own lands. In the latter case the benefits from the use of the water are derived indirectly through the products of the soil, and, in the very nature of the case, through our doctrine of appurtenancy the use must remain distributed among many individuals. In the case of the larger privileges, however, once granted, they often become the basis of monopolies. The public has a vital interest in them; too often their control passes into the hands of a favoured few, so that these few and their successors may make profits out of them altogether out of proportion to the cash capital invested, and the water-laws should be framed so as to guard against this.

Applicants seeking the right to develop such privileges in this province must in the first place do considerably more advertising than other applicants. They must not only advertise the fact that their application and petition are on file and that objections thereto may be entered by any interested party, but they must again advertise when the plans are filed, and both these advertisements must be made in the *British Columbia Gazette* as well as in one or more of local newspapers.

Moreover, since 1897, they have had to obtain both a water record or license and a certificate of the approval of the undertaking. The distinction between these two documents is an important one. The license is the water patent and is issued by the Comptroller. The certificate is the approval of the general scheme outlined in the application as the same may have been amended or modified at the instance of the Government, and is issued by the Ministry.

In dealing with the applications for the larger privileges, while the Comptroller still examines any proposed project from an engineering point of view and determines such matters as whether there is sufficient unappropriated water in the stream, whether the plans of the proposed works are such as to insure the safety and stability of the structures, whether there is proper provision to guard against waste of water, and so on, it is left to the Minister, after an investigation and report by the Board, to deal with the undertaking.

Too great emphasis can not be placed upon the investigation of every such proposed undertaking by the Board. In the course of its investigation it will be sure to bring to light any inherent irregularities or difficulties, and each case will go to the Minister in a pre-digested form.

The certificate of the Minister is given after the hearing of any objections which may have been lodged by interested persons and really amounts to a determination that the undertaking as approved is in the public interest.

Under the present Act, the hearing of the Board and the action of the Minister in regard to the undertaking come at an earlier stage in the procedure than under former Acts. The certificate must not only be obtained before the water license is issued but before authority is granted to make surveys. The idea which underlies this change is that once the applicant is permitted to make larger expenditures for surveys and detailed plants it would be rather awkward to refuse the approval of the undertaking. It is not necessary to have the detailed plant in order to determine such questions as whether the project is in the public interest or whether the financial ability of the company is such as to carry it to completion.

One of the stumbling blocks in the way of conserving the interest of the public in the waters of the province is the activity of promoters who file upon sites far in advance of the time when they can be utilized and afterward they or their successors claim a vested interest in them. These promoters are really middlemen who deal with the Government on the one hand and with capitalists on the other.

Why this mad rush all over the West in quest of power-sites to be filed upon? They talk about the mining fever of the '50's, but future historians will very likely be talking of the water-power fever of the 1900's. The water-laws should make it impossible that any man or group of men merely by the filing of a few documents and the payments of a nominal fee can hold a site until such time as there is some actual need for its development and they virtually say to the public "If you want to use this site, you will have to deal with us." Unfortunately, there are already cases on record in this province where large sums have been offered (I think in one case a quarter of a million dollars) for water privileges secured under prior filings but where little or no development has been made.

Once the public is thoroughly aware that it has an interest in such transactions, once it is clearly understood that this money, in the long run, does not come out of the capitalists who pay it, but out of the pockets of the people in the form of increased rates based on increased capitalization, just so soon will such transactions be discountenanced. The "Water Act of 1914" has some interesting clauses on the point. In the first place there is this investigation by the Board and report to the Minister, already alluded to, requiring the stamp of approval upon the undertaking before the applicant is allowed to proceed with expensive surveys.

The Act does not stop at this point, however. It requires that no license and no authorization to make surveys shall issue to any such company applicant "unless it is shown to the satisfaction of the Minister that the applicant is financially able to carry out the undertaking, and in any case that the authorized capital of the company exceeds fifty per cent of the estimated cost of the proposed works, and unless twenty-five per cent thereof is subscribed and ten per cent thereof is actually paid in cash."

"Is this not too drastic"? some one may ask. My opinion is that it is not. If the clause is to accomplish its purpose and discourage all but legitimate developments, its terms must be plain and to the point. When the time is ripe for the development of power at any particular stream site, capital may be depended upon to come forward with its bona fide application to develop such site. In the meantime, how much better that the province should hold all its unoccupied sites, taking care to accumulate careful data respecting them and giving the same due publicity:

However important the point just made, there is one of still greater importance in reference to the same general subject. It would not be in keeping with enlightened administration to closely watch the granting of these larger water privileges and then cease to have a care about them. The Government must be on its guard every moment. It must see that the particular licensees into whose hands a valuable privilege is placed does not do the very thing which is

objected to on the part of the promoter, that is, place a high valuation upon that which cost the licensees nothing and proceed to charge rates based on valuation.

As the population of the territory in the neighbourhood of a water-power site increases and as coal and other fuel supplies become more costly, the earning capacity of the water-power is greatly enhanced, while the cost of producing a horse-power is not altered. This increased earning capacity is due to the natural asset which belongs to the public, and the public should reap the benefit.

There are two simple methods by which the capitalization of grants can be prevented. One is to make the franchise or license indeterminate, as is done in the state of Wisconsin, Under this method the state can at any time buy back the investment of the company by paying a fair valuation for the tangible works and physical assets of the company plus a fair bonus.

The other method is the limiting of the franchise or license to a definite period of time, say 40 or 50 years, as is done in the province of Ontario and in several states. Under this method the water privileges automatically passes back into the possession of the province at the end of the stated period to become at that time the subject of a new deal between the province and the same or some other licensees. This is the method adopted under the Water Act 1914.[1]

If, at the end of that period, a renewal of the license and certificate is granted, it will be subject to such laws and regulations as are in force at that time. The administrative systems of the province will be in better shape to deal with such problems at the end of 50 years than now; therefore, the public interest of the future generations at least will be safeguarded by the lease systems.

[1]Sections 10 and 81.

APPURTENANCY AND TRANSFERS.

Irrigating wheat, using galvanized dam.

The idea of making the water license appurtenant to the land upon which the water is used has heretofore been given very strong expression in the British Columbia Act. This prevents trafficking in water titles with the consequent accumulation of extensive rights in the hands of a few; it also promotes beneficial use of the water because an applicant is tied down in any case to just what he can benefically use on the particular land in question.

In saying, however, that the water license shall in all cases, be made appurtenant to the land or mine upon which the water or power is used, the Act has in the past gone too far. There may be land which has become water logged, or land with a very inferior soil, Considering society at large, it would not be right that large quantities of water should continue to be used on such land when they could be applied to better advantage on other soil. Or, there may be a mill used for the concentration of mineral ores where it would be very undesirable to hold that minerals from certain claims only could be crushed there. Those claims might be worked out, but the Government would not care to confiscate the valuable development which has been made at the mill site.

The 1914 Act leaves it open to the Comptroller to canvass every situation thoroughly before issuing any license and if he deems it undesirable that the license should be made appurtenant to the undertaking or project of the licensee, defining that undertaking just as the land might be defined by metes and bounds.

Irrigation licenses will, in every case, be made appurtenant to the land itself; but to avoid the evil consequences following the attachment of valuable water rights to inferior lands, the Act provides a means by which such licenses may be transferred. The consent of the owner of the license sought to be transferred must be obtained; the standard of the use proposed must be as high as or higher than that under the existing license; the same publicity must be given by way of advertising and publishing notices as in the case of a new application and the rights of existing licensees must not be prejudiced by the transfer. Here

again, the British Columbia Act is stricter in its requirements than other Acts, which place this whole matter of transfer, in the discretion of their state engineers.[1]

Provision is also made for the transfer of licenses for the sale, barter, or exchange of water or water power.[2]

The above methods of transferring licenses may seem a little inconvenient at first glance, but, in opening the way for transfers, caution must be exercised not to give a loophole for defeating the main purpose of this Act.

DUTY OF WATER, AND IRRIGATION RIGHTS.

One of the perplexing questions for every Government to answer is as to how the quantity of water which is to be allotted for irrigation purposes to any particular lands is to be determined. The farmers will all tell one story that the soil even of the same neighbourhood differs greatly; there is the porous gravel, the mpervious clay, and the medium loam.

British Columbia, wisely, I think, has refrained from giving expression in her Water Acts to any stated duty of water for her lands, whether as a maximum or otherwise. Some of the states have followed a different policy in this respect, Wyoming having established a flow of one cubic foot per second of water for seventy acres of land as a maximun duty.[3] While in Idaho the maximum is one cubic foot per second for fifty acres.[4] The Idaho statutes go farther and specifically make every water binding upon the state as to the right of licensee to use the amount of water as therein mentioned.[5] The information that experts have accumulated on the subject of "Duty of Water" suffices to show that the quantity to be allotted varies greatly according to the location and character of the soil; only an investigation extending over years can satisfactorily decide the proper duty; therefore the only safe course to follow in the meantime is to make every license subject to subsequent re-adjustment at a future time and to limit it to such quantity as may be determined in the future to be suitable for the lands in question. This is done in the British Columbia Act.[6] There is also a clause limiting the quantity which may be diverted by any licensee to the requirement of the particular crop which is grown on the land from time to time.[7] In keeping with these provisions, every license for irrigation purposes shows on its face that the quantity therein mentioned is subject to alteration in the future.

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[1]Statute Wyoming 1910, 725-6. Oregon Laws 1909, c. 216. s. 4 (being s. 6629 or Title XLIII. of Lord's Oregon Laws). Idaho Civil Code ss. 3255, 3264, being Laws 1907. 314 s. 1 and 1903, 223 s. 11 as amended 1905, 27 s.1. and 1907, 507 s. 1.

[2]Section 14

[3]Wyoming, Compiled Statutes of 1910, section 777.

[4]Idaho, Civil Code, section 3253, being Laws 1903, 223, s. $1\frac{1}{4}$ as amended by Laws 1903, 357 s. 1.

[5]Idaho Civil Code section 3262.

[6]Section 20, 29, and 125.

[7]Section 127.

The Act places power to compel rotation in the use of water by licensees for irrigation purposes in the hands of the engineer of the water district,[8] and if licensees can not agree as to the proper distribution of the waters of any stream, the Minister of Lands may, on the recommendation of the Comptroller, appoint one or more water bailiffs on any stream.

These water bailiffs have the necessary powers to lock headgates, make arrests, and supervise the distribution of water under the direction and guidance of the engineer and the Comptroller. The Minister determines their compensation, which is paid by the licensees in the locality affected in proportion to the respective quantities of water used by such licensees, or to the respective quantities of water which they are entitled to use as the engineer may determine. To facilitate the collection of the amounts due, they are made a charge upon the lands to which the licenses are appurtenant.

The new Act provides that every person diverting water from any stream shall construct and maintain a substantial headgate and such weirs or other measuring devices as may be required. Several of the states have enactments on this subject, but British Columbia goes farther than any of them inasmuch as the Act authorizes the Comptroller, if the licensee fails to construct his headgate after being so directed, to cause the same to be constructed and all costs and charges connected therewith are to be paid by the licensee and if not so paid become a charge upon his land. This certainly ought to insure the construction of headgates whenever the department is ready to order such construction.

RIPARIAN RIGHTS.

One of the most interesting questions that has centred around the Water Act in recent years is as to just what extent, if any, those persons who own land adjoining the banks of a stream technically known as "riparian proprietors" have a right to use the water of the stream without a record. In 1892, the legislature of British Columbia enacted a section dealing with this question, respecting the meaning of which there has been and still is a wide difference of opinion.[9]

The people of British Columbia have exercised a great deal of patience in waiting for either an interpretation of the doubtful clause by the courts or a definite word on the subject from the legislature. A case which was pending at the time the present Water Act was adopted went up to the Privy Council last June and the judgment in that case has at last thrown a degree of light on the subject. It gives us this much information:—an owner of land adjoining the stream banks who acquired his title from the Crown since 1892 and who has made no use of the stream water can not, on the mere claim of his riparian ownership, enjoin a record holder from diverting the water under his record. The right of the record holder, under such circumstances, takes precedence and he may divert even to the full extent of the stream flow. In other words, the right

[8]Section 126.

[9]Section 34. C. f. Revised Statutes Colorado, 1908, s. 3236-7 and 3246.

[9]This section was almost identical in wording with a similar section in the Irrigation Act of the province of Victoria, Australia, passed in 1886 (50 Victoria No. 898 s. 4), and has been preserved with practically no change in all the Acts of the province since 1892, being section 4 of the 1914 Act.

of such riparian owner to have the water of the stream flow by his land undiminished in quantity has clearly been taken away by the statutes of British Columbia.

Even with this one phase of the law definitely interpreted, there is still a large realm of doubt left. What shall be said of a riparian owner whose title to his land antedates 1892? What shall be said of a riparian owner who has made beneficial use as opposed to a subsequent record holder? Again, what shall be said of the interim right of any riaprian owner in the province to an interim use of stream waters until such time as such waters are totally appropriated under records and licenses? Again, what shall be said of raiprian owners in the Railway Belt, who acquired their titles from the Dominion Government during the period when the Water Acts of the province were not so effective in that Belt? Must the people of the province wait for judicial decisions on all these points before they may know what the law is? This may be many years. Is it not preferable to draw a distinct line of demarcation and say without prejudice to rights that have accrued in the meantime, "From now on, the law is so and so?"

That is exactly what has been done in the new Act, and with the acceptance of this Act by the Dominion Government, which is confidently looked forward to in the near future, the perplexing situation as to just where riparian rights begin and end in this province will be in a fair way to be cleared up. The clauses referred to read as follows:—

"6. (1) Every riparian proprietor claiming any right to divert water or to the exclusive use of water for any purpose by virtue only of his being such riparian proprietor shall, on or before the first day of June, 1916, file with the Board a statement of claim setting forth such of the particulars contained in section 294 as may be applicable to the rights claimed.

"(2) After the first day of June, 1916, no right to divert water or to the exclusive use of water for any purpose shall exist by virtue only of any riparian ownership of land, and no claim therefore shall be entertained, saving only the general right of the public to the temporary use for domestic purposes of water to which there is lawful access, subject, however, to the rights of any licensee."

Claims filed by riparian owners under this section will be dealt with by the Board in the same manner as claims based upon records. This legislation, when adopted by the Dominion Government, will have the effect of having every right to divert water from any stream in the province whether within or without the Railway Belt made the subject of a license and this in turn will be conducive to good administration.

Since 1911 no one can acquire a storage license in British Columbia unless he already holds a diversion license authorizing him to use water in a particular manner, and the quantity mentioned in the storage license will be limited to the quantity which can be used beneficially under the diversion license. This is a strong feature in the Act and makes it consistent throughout. The storage sites are limited in capacity just as the natural flow of the stream is limited. Every effort is being made to see that the natural flow of a stream is beneficially utilized. Likewise every effort should be made to see that the storage sites should be preserved for those who have use for them. Under this plan the land owners

themselves will own the storage rights just as they now own the diversion rights.

If it is against policy to have carrying companies operating between the farmer and his source of water supply, likewise it is against policy to have a storage company so operating. True, the individual has not the resources at his command for building large storage dams, but under the Act numerous forms of co-operation ownership and control are provided. When the time is ripe for the development of any particular reservoir site, I feel that a way will be found for developing it under the present policy of the Act, and that the result will be for the lasting benefit of water right holders. If the opposite principle were accepted and any person who desired to build a dam could acquire a storage right, the results would be unfavourable to good administration.[1]

STRINGENT REQUIREMENTS.

The Water Act has been criticized here and there because of its stringent requirements. In bringing any new systems of administration into operation, however, and especially in changing from easy-going methods to stricter ones, a little inconvenience must be felt by the public. Think of the confusion in water titles and the expensive investigations by the Government which might have been saved if the framers of the early Acts could have exercised a little more foresight in drafting their water clauses.[1] Owing to the systems in vogue years ago, the Board of Investigation is to-day at great labour and expense doing the work which the Commissioners who made the records could have done with comparatively little inconvenience at the time. In the light of this experience, the aim of the present Act should be to tie every applicant down in absolutely definite terms. This will lead to better understanding in the end and will avoid expensive litigation. (Applause.)

CHAIRMAN: If there is no discussion on this paper, I will ask the Local Secretary to make some announcements.

Mr. DYNES: Mr. President, ladies and gentlemen,—I am requested by Mr. McCoy, the President of the Aquatic Club, to specially announce that all the events this afternoon are open to everyone. I may say that this regatta was specially put on for the entertainment of the visitors. (Applause.) It is customary to have the regatta on Thursday afternoon because the other towns along the lake have a Thursday afternoon half holiday, thus ensuring a larger attendance.

An arrangement has also been made with Mr. Philip H. Eraut, in charge of our local irrigation committee, to give a short talk to-morrow afternoon on

[1]There is a case on record in Oregon where some promoters, having no lands of their own, got on the track of a large project which involved the use of a certain storage reservoir; these men rushed into the state engineer's office with prior filings on the reservoir. It was simply a hold-up game, and the purpose of the whole project would have been defeated if the promoters had secured the storage right. The Board of Control refused to deal with them and the Supreme Court of the state upheld the Board on the ground that it was against the public welfare to grant a right of that nature to persons who had not the lands upon which to use the water (Cookingham et al v. Lewis et al 114 Pac. 88).

[1]Among other things those Acts did not call for a description of the lands where the water was to be used, and one record might mention half a dozen different uses for the water.

municipal irrigation. Soon after his talk will be the motor trip when you will see the irrigation system about which he will tell you.

CHAIRMAN: We are now going to have another talk from Mr. Smith.

Mr. C. L. SMITH: You who were here yesterday will remember that I made the statement that the measure of civilization of any people was the character of its homes and the manner of living in those homes; that they were more important than bank clearings and commercial transactions. I would have liked this morning, if I could have started at eleven o'clock, to have given you somewhat fully a talk on home-making that in some form or another I have given two or three hundred times a year for the past thirty years, and I have seen results accruing to the benefit of those who listened to it, from that talk in a larger measure than from any other subject I have ever talked on. If I might select a text for my talk, because some people call it a sermon and would like to have it delivered in their churches, it would be a little couplet from Burns, who says "To make a happy fireside clime for weans and wife is the true pathos and sublime aim of human life." (Applause.) And I would like to leave the thought that when life's work is done for one and all of us, we will be remembered by the good we have done rather than by the dollars we have accumulated. (Applause.)

I was just thinking when Brother Elliott was talking what might possibly have been my field work if I could have had the opportunity sixty years ago to go to such a school as he described to you here. Nothing of that kind had ever been heard of then. My parents settled in the woods of Southern Michigan and my earliest recollection of life there on that farm was living in a little log cabin. I never even had a common school education. Four months during the winters of 1855-6 and 7, I had the opportunity each winter to sit on a wooden bench and study how to spell some common words and to copy sums in Adams' arithmetic, five of us using the same book, and the teacher, a Baptist minister, used to write out some letters on sheets of foolscap, which I would try to imitate. That finished my education at school. As I told you yesterday, from those associations I imbibed certain ideas and one of them was that the best man in the community was the man who had the pleasantest home and home surroundings. I have never forgotten the impression I received from a picture in a little Sunday school book, of a haggard old man sitting on the floor in a bare room, a candle in front of him, and between his legs, some bags with the dollar mark on them and he was gloating over those, and underneath it said "The Miser." That is all I remember of it. I don't know what the reading text was in connection with it but I grew up with the fixed idea that the man living for money could make the meanest man on the face of God's green earth; therefore, I never had any particular sympathy with any individual engaged in any enterprise simply for the money he could get out of it rather than for the good he could do. Of course, when I work, I like to have somebody pay me for it, because if there is anything I like better than talking about the things I believe, it is spending the money I get for doing it (laughter) and I generally manage to spend all I can get and enjoy the spending of it. I enjoy this work so well that I keep at it all the time and while some members in my audience sometimes get mad at my plain

speech, they nearly always want me to come back. I remember once that a man and his wife had been quarreling because he persisted in allowing the hogs to run in the door yard. I knew nothing of the incident, but it so happened in my talk that morning, I said that there was a place for a hog on every farm but it was not in the front door yard. (Laughter.) That man got up mad and went out of the hall and the next morning he gave me quite a little tongue lashing for insulting him before all his neighbours (laughter) but next year, when I came back, I heard that he had the front door yard fenced. (Laughter.)

During my early experience among the farms, an impression I received was this: whenever I found a man who was making good, he patted himself and said "I did it" (laughter) and whenever I found a failure, the poor, deluded fellow always laid the blame on somebody else. (Laughter.) A little later I want to refer to two contrasting pictures of this kind that I use in my home making lecture which, by the way, is only fourteen hours long. (Laughter.)

I have lectured in Farmer's Institutes and for various organizations for more than thirty years. My hobby has been diversified farming, and improvement of living conditions on the farm. At the present time I am employed by the Oregon-Washington Railroad and Navigation Co., to devote my whole time, and energy to the improvement of the condition of the farmers living in the country reached by our lines. I am frequently asked the question, "Why are the railroads interested in improving the condition of the farmers?"

The traffic managers of our large transportation companies have long recognized the fact that any section of the country devoted to a single crop system of farming is an unreliable and unsatisfactory source of revenue. Their statistics demonstrate the fact that the largest volume of business not only comes from a district where a diversified system of farming is carried on, but such business is more equally divided throughout the year and can therefore be carried on more economically and satisfactorily. It is also a recognized fact that only a small percentage of the productive capacity of any given section has as yet been fully developed. Any increase of business must necessarily come from the development of these latent resources. There are three directions in which we may look for future development: First, the clearing and bringing under cultivation of logged-off lands. Second, the increase of irrigated areas by the use of storage reservoirs and pumping plants. Third, and most important, the breaking up of large holdings already under cultivation into smaller farms. This necessarily means more people on the lands, more profitable and continuous employment of labour, more intensive methods of cultivation, more and better livestock, more business for the merchant, the banker, the manufacturer and the transportation companies.

It was probably for some reason like the above that Mr. R. B. Miller, Traffic Manager of the O.-W. R. & N. Co., employed me to study the situation and suggest methods for improving the conditions in the country served by the O.–W. R. & N. Co. At the first conference that I had with Mr. Miller and Mr. Farrel regarding my work, we reached the conclusion that the promoting of orcharding had been pretty well exploited, in some instances possibly overdone. Therefore I was given permission to exploit my hobby of diversified farming, and I am happy to say that the results secured are not raising any less fruit or

wheat, but they are milking more cows, feeding more pigs, producing more meat and spending more money.

One of the strongest reasons I have had for advocating diversified farming with dairying as a factor is the fact that experience and observation have led me to the conclusion that this system of farming results in better homes and better home conditions than a single crop system of farming.

Perhaps the best way for me to interest you in the subject would be to give you some of the reasons why this is one of my pet topics, a sort of hobby that I always ride whenever the opportunity offers.

As a farmer's boy in a new country I became familiar with all those conditions that attend pioneer life—the struggle for bare necessities, the hard work, all the coarse, rough and rude surroundings as well as hopes and ambitions for better things, when more land will be brought under cultivation, when herds and flocks will be increased, orchard in bearing: and the glad day when the new house will be built. I have thought sometimes that it was fortunate for me that the community was largely made up of thrifty New Englanders who brought with them to the new country a knowledge of, and taste for better things, the cosy farmhouses with neat dooryards, spreading shade trees, the old fashioned flower garden with its lilacs and roses, its hollyhocks and marigolds, and I have never forgotten the first spring on our own farm when the johnny-jump-ups, grown from seed sent from Connecticut in a letter, first blossomed. They were very small in comparison with the pansies that we have today, but they had the same rich colouring of gold and purple. Our first rose bush, was grown from a slip contributed from one of the neighbour's gardens. Lilacs and honeysuckles were procured in the same way. A little was added each year until in a few years the door-yards in the neighbourhood were bright with flowers of every colour from early spring until late in the autumn. And then there was the vegetable garden where mother and the children seemed to have the greatest interest and did most of the work. Horse radish that moved me to tears when I had to grate it, and the pies that mother used to make from the first stalks of pieplant, and the early greens from mustard to dandelions to be followed by the early beets and spinach, then asparagus, "sparrow grass" we used to call it. Then came the early peas, string beans, crook-necked squashes and the first mess of green peas and new potatoes was always an event that was looked forward to with bright anticipations. Strawberries, raspberries, currants and gooseberries and after a few years the harvest apples, cherries, pears, plums and late apples that we used to store away for winter use. I have seen all of these in abundance while the farmers yet lived in the settler's log cabin, only a few acres had been brought under cultivation, and very little, if anything, had been produced to sell.

Three years before the outbreak of the Civil War a change of location brought me into contact with a different class of people in an older settled country, large farms, larger houses and somewhat different conditions of living. This was among the Hoosiers of southern Indiana. They were accustomed to living largely within themselves. The major portion of the farmer's clothing was carded, spun and woven by the mothers and daughters. What they had to eat was grown on the farm. About the only things they sometimes bought from

the country store were tea, coffee, sugar and sometimes a little rice. They had hominy and cornmeal mush but had never heard of breakfast foods. Eggs, poultry, beef and pork, they had in abundance. The bacon was made at home. They were hospitable entertainers, and wherever I visited, although I carried with me a healthy boy's appetite, I always got enough to eat.

This pretty nearly covers my experience and observations of farm life up to the outbreak of the Civil War. You will readily see from this experience how naturally I formed the idea that for one to live on a farm meant an abundance of good things to eat, grown by the farmer and his family. Right here I wish to explain that up to this time in all my experience I had never heard anything that even suggested the idea that anybody anywhere, ever secured land for the purpose of making money. My only conception of farming was "Home Making." After the war when I settled in Minnesota, I became familiar with other phases of farm life, some of them almost ideal, some others less satisfactory in character. I can best illustrate this perhaps by relating a little experience through which I became familiar with the contrasting conditions of farm life and interested in the problem, "Why such difference?" That portion of the state in which I lived was a fertile rolling prairie where one could go miles and miles without seeing a tree or shrub. The country was new, very few of the settlers having been on their homesteads more than three to five years, and as usual with pioneers their means were very limited. Physicially unable to perform severe manual labour, the first employment that I undertook was canvassing for the sale of nursery stock. This necessarily brought me into direct contact with the farmers and their families at their homes. And I found in these homes such radical contrasts to those with which I was familiar that they naturally attracted my attention and excited my interest.

Driving along the road across the prairie one June day in 1866, about 11.30 a.m. I began to get hungry; coming to a settler's cabin that stood in a corner of a wheat field, I saw a man down on his knees beside a mowing machine which he was evidently repairing, getting ready for the annual hay making. There was a small stable about one hundred feet from the house, and in the space between the house and the stable, was a McCormick reaper, a broadcast seeder, two plows, a hay rake, an old harrow, an old wagon and a pair of bob-sleds, evidently where they were unhitched from the last time they were used. I asked the man if I could get some dinner; he got up, looked me over and said yes, he guessed so if I could put up with what they had to eat. "You can probably stand it," he said, "for one meal, we have to all the time," and then went on with his work. Not a very cordial or hospitable greeting, but I was hungry, so I unhitched my horse, gave him some oats which I carried in a sack, under the seat, and then sat down on the tongue of the mower to talk to the man while he worked. About the first intelligible words that the man said were that the man he bought the mower of cheated him, and then he went on to explain that all of the agents or canvassers were rascals and liars, and that the farmers were their special prey. While he was dilating on this topic, a sour-faced middle-aged woman with a shrill voice came to the door of the cabin and said, "Dinner's ready." He dropped his wrench, wiped his hand on his ragged overalls, and told me to come on. We went into the house, he said to his wife, "This man wants some dinner." She

said, "All right, only it ain't much of a dinner." We sat down to the table, I wanted to wash but I did not see any opportunity and as the man had seated himself at the table without washing his greasy, dirty hands, I concluded to make the best of it and sat down on a stool at the place indicated. The man said, "We haven't got any potatoes, we raised quite a few but they all froze up during the winter and we haven't had any since; about a month yet before we get new potatoes; this country is so cold it isn't fit for a white man to live in anyhow; the Lord made it for Injuns and buffaloes and I think it would be a good thing if he would give it back to them." Then he passed me the bread which was neither well made nor well baked, the baking not the fault of the woman, perhaps, as the cooking stove was old and cracked, and as nearly as I could judge from observation, the supply of wood was small in quantity and inferior in quality. They had fried salt pork, which the man informed me he had bought in Lake City at fourteen cents a pound. I asked him how long he had been on the farm, he said, "Five years." I asked him if he did not raise any hogs. He said, "No," he had too much sense to try to raise hogs where a man could not raise corn. I I asked him if he had tried to raise corn, and he said a man was a fool to try to raise corn where they had frost nearly every month of the year. I asked him if he kept chickens and he said that the winters were too long and too cold, the hens would never lay in the winter and in the summer eggs were never worth anything and it would cost more to feed a hen that she was worth. I asked him if he had any garden; he said he hadn't time to bother with little things like that. I asked him if he kept cows; he said it was too much bother, he hadn't any pasture and nobody to herd the cows; and it did not pay any how to keep cows where there were such long winters. They had some strong black coffee; he apologized for not having any sugar or butter, as they had not been to town for two weeks.

Here you see the only things they had to eat were bread and meat, bought from the town 18 miles away and as I learned afterwards, bought on credit to be paid for after harvest. The man assured me that because he had to buy on credit he was always cheated on the price, the bill was always larger at the end of the season than it should be. They had tried different merchants but every one of them was dishonest and cheated him whenever they had the chance. I did not see the children as they were away to school; but while I was hitching up my horse after dinner, feeling sort of uncomfortable from the effects of the conversation, I looked over the house and its surroundings and I thought, what a life for a man, woman or child to live in such a place year after year. I had asked the man to buy trees, plants or seeds to start a grove of timber, start some fruit in the garden, urged him to make a garden pointed out what a nice yard he could have, with a few trees, a fenced grass plot, and a few flowers, but he assured me that he was not able to have any of these things, anyhow, he was just "staying" until he could make enough money to move into town, where he could have better opportunities to educate his children; he was "going to sell out the first chance he got anyhow." I tried to argue with him that a small amount of money and labour spent in improvments would greatly increase the selling price of his farm, but he turned a deaf ear to all my suggestions, and I rode away with a feeling that if that was farm life, on the prairies of Minnesota, I did

not want any of it. And as I rode along in the bright June weather, the green prairie dotted here and there with bright flowers, I wondered whether it were true what this man said: that their coarse and rude surroundings, untidy, unthrifty condition, lack of necessities and comforts of life were, as he had maintained, due to the climate or to any economic condition mentioned. And the more I pondered the matter, the more fully I came to believe that the fault lay, or perhaps more properly speaking, the cause of the unsatisfactory conditions was in the man himself rather than in the soil, the climate or business conditions.

In pleasing contrast to this, only a few miles away, and at about the same hour of the day, a few days later, I came to a small field of corn at the left of the road. The corn was from 2 to $2\frac{1}{2}$ feet high. The rows were straight and there was was a very good stand of thrifty, rank growing stocks. A man with one horse and cultivator was coming down the row towards the road so I stopped and waited until he came out to the end of the row and I asked him the question, "Can I get some dinner here?" And he answered cheerily, "Oh yes, we always have plenty to eat." And when he asked my business, and after a few pleasant remarks, looked at the sun and said that it was not quite noon and he wanted to make another round before dinner. He said, "You drive up to the house, put your horse in the barn, tell my wife I said you could have dinner and it will be all right."

I saw a boy with a dog over on the prairie a short distance from the house herding some cows, and as I came up to the house I saw that something like a quarter of an acre of ground in front of the house had been enclosed with a plain board fence, several young shade trees had been planted, the ground raked smooth and thickly seeded to blue grass and white clover, some lilacs, some syringas, a few rose bushes and a little bed of annual flowers, some of them just coming into blossom made the front of the house look neat and homelike. Back several rods from the house to the north and west was a considerable area, four or five acres, of newly planted willows and cottonwoods; within this area something like an acre had been fenced with lath for pickets for the vegetable garden. At the side of the barn or stable, because it was a very small building with no loft, was a shed under which was neatly packed away all of the farm tools and machinery. There was a gate on the side of the yard towards the barn and from this a neat board walk led to the side door of the house. There was no rubbish about, everything looked neat and tidy, and among other things I noted was a wood shed, because that was an unfamiliar sight in that neighbourhood. After taking care of the horse, I went up to the house, rapped at the door; a cheery faced woman answered my rap, asked me to come in. I told her my business; she said all right, dinner wasn't ready yet, but for me to come in and sit down. She asked me if I wanted to wash, showed me a clean wash basin with a clean bowl and a clean towel, soap and plenty of fresh water, apologized, however, that their house was small, and they had but few conveniences, but I noted that everything was neat and clean. She showed me into a little "front room," the furnishings of which were cheap but neat and in good taste; a small centre table held a few magazines, newspapers and books; I heard some children laughing out of doors and their mother called them to come and get ready for dinner; in the meantime the farmer came in to dinner and while

waiting engaged in conversation. I found him very cheery and good natured. He spoke about the pleasant weather, how nicely things were growing, thought that they had just about the right amount of rain to produce good crops, and was optimistic enough to have faith that prices were going to be satisfactory. Informed me that he had been five years on the place, that he had begun with practically nothing but had added a little each year in the way of improvements. They were in hopes in a few years to be able to build a good house, that he had a nice crop started, but that he had only about half of his 160 acres under cultivation as that was about all he could handle without getting into debt and he did not like to do that.

The wife called us in to dinner; and I was ready, for several times there had been wafted to my senses an odour of chicken cooking, and I realized that I was to be treated to something better than bread and pork. The same room was used for both kitchen and dining room, only a pine board table, but there was a clean white cloth on it. Things were neatly arranged and I noted at a glance the fact that the bread was well made and well baked and thought that perhaps the woodshed had something to do with it. There was a dish of white, creamy mashed potatoes on the table, and the farmer helped me to a liberal supply of this as well as stewed chicken. Always having been of an investigating turn of mind, I said, "Where do you get such nice potatoes at this season of the year?" He said, "I always sort out a few bushels of my best potatoes in the fall of the year, at digging time, and put them carefully by themselves, covering them with a layer of straw and a few inches of dirt, then another layer of straw and more dirt so as to be sure no frost can get at them. After the ground has frozen and snow comes, I haul a couple of loads of manure and spread over the heap; this keeps the frost in the ground until late in the season and we never open the pit until sometime in May. By handling them in this way we keep potatoes sound and good until the middle of July."

My next surprise came when the good wife passed me a saucer full of asparagus stewed in cream, and I said, "Do you raise this?" He answered, "Oh yes, we couldn't get along without asparagus. I bought an ounce of seed for ten cents the year we came here and raised plants enough to plant three rows across the end of the garden. We have all we want to use through the latter part of May and all of June. By that time we have peas and other vegetables and we let the asparagus grow and store up strength for the next crop. We seldom cut any after the green peas come; we not only have all we want for our own use but nearly every time we go to town during the month of June we take two or three dollars' worth to sell and frequently sell some to the neighbours. I tried giving it away at first as an inducement to them to plant and grow for their own use, but most of them are either too indifferent or lazy to do it and I concluded that if they wanted it they might pay for it. Several of them paid us more for asparagus during the year than it would have cost them to plant, cut and care for such a plot as I have."

As the butter was passed I said, "I see you keep cows." He said, "Oh, we couldn't get along without cows, they are nearly half our living." And having in mind what I had heard at the other place, I said, "Does it pay to keep cows?" "Oh," he said, "as to that I don't know how you would figure it,

we wouldn't get along without them; we grow all of the feed, and whatever work it is to take care of them is generally done when we would be doing nothing else; then there is the increase in the young stock. What we use is certainly worth more to us than the trouble of taking care of them and we have quite a bit of butter to sell, so we figure that pretty near all profit. Oh, yes, I guess it pays to keep cows; anyhow, pay or no pay we wouldn't do without them."

Then I said, "I see you keep chickens, does that pay?" "Oh, yes," he said, "chickens don't cost anything hardly, and we have all the eggs we want to use all the time, chicken to eat whenever we want it, and we sell a great many eggs during the year." And then his wife broke in with, "And I sold enough dressed poultry last fall to buy the shoes, stockings and winter clothing for the children and myself." So the conversation ran on until I was pretty well filled up with stewed chicken, mashed potatoes, asparagus and nice bread and butter when the good wife got up from the table, went to the side of the room and from a shelf brought out some nice strawberry shortcake. This was a surprise, indeed, the first I had seen in the state, but I was much like the Irishman who undertook to eat through the bill of fare at the hotel. After filling up on two kinds of soup and fish, they brought on the roasts, Pat looked at the array and said, "Oh, my, here's the opportunity of me lifetime, and me so full of soup I can hardly breathe." But the strawberry shortcake was tempting, and I made room for it.

I said, "You grow strawberries, too?" "Oh, yes," he said, "we have had the strawberries ever since the first year. I had only one hundred plants to begin with. They cost me $1.25 sent by mail from Ohio, but nearly every one of them lived and from the new plants that I got that year I put out one-tenth of an acre. We have all we can use and sell some to the neighbours. We have been selling strawberries now for about three years but I don't believe there is a neighbour within three miles of here who has planted any, though I have offered to give them plants, if they would come and get them."

I thought to myself it was a poor chance to sell strawberry plants if the people were so indifferent to the matter. And questioning him further as to the expense, I learned that he could grow a bushel of strawberries about as cheaply as he could grow a bushel of potatoes. He said that he had quite a start with currants, gooseberries, and crabapples, and some wild plum trees that he had dug up near the river and planted out; they had been bearing now for about two years, furnishing them what they they wanted for their own use. The last year they had sold several dollars' worth. This year would have still more to sell as the trees were just loaded with fruit.

You may well understand that I rode away from this place with an entirely different feeling and a much higher idea of farm life on the prairie than I had the day before.

During my entire stay, which was something over two hours, I really enjoyed myself. I never heard a word of complaint from the farmer or his wife about the soil, the climate or the condition of the country. They didn't tell me anything about being cheated or robbed; they did not groan about the condition of the farmer and they did not say anything about selling out. They seemed to be prosperous and contented. They had a good farm, their herd of cattle

was increasing, they had no debts, they were provided with all the necessities and many of the luxuries of life; not only that, but they were full of hope for the future, contented and happy. And as I rode away and looked out over the broad prairie dotted here and there with bare, comfortless cabins, without a tree, shrub or vine to break the force of winter's wind or shelter from the hot sun of midsummer, I asked myself the question, "Why is it that men slave early and late, depriving themselves of these beauties and luxuries so easily within their reach, in a blind struggle to produce something that they can exchange in the market for money, never stopping to count what luxuries and comforts that money will buy that can compensate them for the hardships and deprivation endured to procure?" Of course I had never heard of a farmer's institute then, nor ever dreamed that I should stand in public and talk on the subject of home making. But unknowingly I was learning a lesson that has not only been of value to me, but that I have tried to make of value to others. Through experience and observations of like character for twenty years, the conviction grew upon me that any man who owned a bit of land might have a home with trees and flowers and grass and sunshine; might have a garden where he could grow an abundant supply of fresh fruit and vegetables, might have new laid eggs, fresh butter, milk and cream; in fact, might have of his very own the better things that earth produce if he only willed to do it. Therefore you will see how naturally and logically, when in after years I attended my first farmers' institute and had a chance to "talk," my first demonstration was the advantage of diversified farming and before I had finished I was pleading for a place in that system for the cow, the pig and the hen and not stopping at that, urged the planting of trees, the fencing of the dooryard, to be used as a playground for the children and a place for the flowers, and not a chicken yard and hog pasture.

There has never been a time before, in the history of the country, when so many people in all the various callings of life were honestly interesting themselves in the welfare of the farmer, the improvement of farm life and the methods of farming, as there are at this time.

That the interests of all the people are mutual, and that there should be mutual co-operation for mutual benefit is a growing sentiment that is already bearing fruit, in better feeling between town and country, between transportation companies and the people they serve. Abuses are being corrected and misunderstandings explained.

I will give one illustration that shows the drift of sentiment. In the readjustment of business following the Civil War, the farmers seemed to be getting the worst of the deal, and in their first attempts to correct some of the evils they were too radical and failed to give due regard to the rights of others. This brought on a sharp conflict, especially with public corporations. Many farmers came to regard all corporations as unnecessary evils that ought to be abolished. In the struggle for some equitable adjustment I was associated with the farmers and formed some close friendships with those who were trying to improve conditions. Among these was one who always regarded a corporation much as he did a rattlesnake. Although we often differed, it did not impair our personal relations. Many years ago he sold his Minnesota farm and moved to Oregon.

In the summer of 1901 I was asked by the traffic department of the Southern Pacific Railway Company to deliver a series of lectures on "Diversified Farming." "Dairying" and "Home Making" in the Willamette Valley. These lectures were well attended, aroused much interest and stimulated the dairy industry to a marked degree. One morning as I was waiting at the depot for a train, I saw approaching, a grey whiskered, elderly man, who, when he was within twenty feet of me, threw up his hands and exclaimed, "Great God, I guess its true." I recognized the voice of my old friend and greeted him, cordially. He shook his head and exclaimed, "I wouldn't have believed it. We read the reports in the papers and Mary said it sounded like our C. L. Smith; but I said, 'No, Smith would never work for a corporation,' so I drove up here eight miles to make sure. How could you ever backslide so far as to go to work for a corporation. I can't understand it."

"Why, it is all right. I am doing just the same kind of work I always did, and in the same way. The only difference is you and the other boys used to have to go into your pockets for money to pay my expenses. Now the corporation finds it pays them to put up for salary and expenses too, which enables me to do more and better work."

"I can't understand it, I wouldn't have believed it, there must be a nigger in the fence somewhere," he kept repeating.

Then I told him to come to Salem on Saturday and he would be better able to judge whether it was right or not. He was still sceptical and shaking his head as I boarded the train.

At the Salem meeting he and his wife were on the front seat, and for more than an hour I talked better farming, better living, better homes and home conditions, then closed with a few of the old familiar poetic quotations that had stirred the hearts of our farmers friends back there in Minnesota:

"Give knaves their gold
And fools their power;
Let fortune's bubbles rise and fall.
Who plants a tree or trains a flower
Is more than all.
And God and man shall own the worth
Of him who dying leaves as his bequest
An added beauty to the earth.

"One our faith and one our longing
To make the world within our reach
Somewhat the better for our living
And the gladder for our human speech.

"Let us scatter the germs of the beautiful;
By the wayside let them fall,
That the rose may bloom by the cottage gate
And the vine on the garden wall.
Cover the rough and the rude of earth
With a vale of leaves and flowers
And count by opening bud and cup
The passing of the hours."

If along these lines our lives are ordered then we can say as did the grand old Quaker poet on his last visit to his boyhood home at Haverhill:

"Adrift on time's returnless tide
As waves that follow waves, we glide.
God grant, we leave upon the shore
Some waif of good it lacked before;
Some seed or flower or plant of worth;
Some added beauty to the earth;
Some larger hope; some thought to make
The old world happier for our sake,
That only grateful hearts shall fill
The homes we leave."

Then my old friend with tears in his eyes sprang forward, clasped his arms around me and said, "God bless you Smith, go to it. If you can get the corporation to pay you for work like that, it is all right." (Loud applause.)

Irrigating with canvas, galvanized and earth dams.

Mr. E. FOLEY-BENNETT: Mr. President, ladies and gentlemen.—The Committee on Credentials beg to report that they have carefully examined all credentials to date and find that there are 169 duly accredited delegates, and five delegates whose credentials are not quite complete, making 174 in attendance. (Applause). Mr. President, ladies and gentlemen, I am very pleased indeed that it is my privilege to state this. In view of the fact that only a short time ago the cancelation of this Convention was seriously considered, it speaks for itself. If I were wishing to boost my local place, I might say that this attendance was caused by the attractions of Penticton, but I am not going to say that because it is not

true. The credit for this most successful gathering, in my opinion, is due to the splendid methods pursued by our permenant secretary, Mr. Rankin. (Applause.) A short time ago, when questioned on this matter, he promised he would make this the record convention in the history of our association, and as representing the Board of Trade, Mr .Rankin, I wish to tender to you the Board's sincere thanks for bringing this record convention to Penticton. (Applause.)

LIST OF DELEGATES AT THE PENTICTON CONVENTION.

Thos. Abriel, Arrow Lakes Farmers' Institute, Nakusp, B.C.
A. P. Augusten, Water Rights Branch, B.C. Govt., Penticton, B.C.
Frank Adams, U.S. Dept. of Agriculture, Berkeley, California.
W. E. Adams, Central Okanagan Lands, Ltd., Kelowna, B.C.
L. O. Armstrong, Lecturer, C.P.R., Dept. of Natural Resources, Calgary, Alberta.
John Anderson, Corporation of Penticton, B.C.
T. H. Boothe, Farmers' Institute, Naramata, B.C.
J. R. Ballingal, Fruit Growers' Union, Penticton, B.C.
R. A. Barton, Southern Okanagan Land Co., Penticton, B.C.
W. J. E. Biker, Nelson District, B.C. Government, Nelson, B.C.
F. N. Brown, Trail Fruit Fair Association, Trail, B.C.
Alex. Beatty, Penticton School Board, Penticton, B.C.
Mrs. F. N. Brown, Trail, B.C.
F. H. Barnes, Dept. of Agriculture, Vancouver, B.C.
O. J. Bergoust, N.E. & N.W. Kootenay, Revelstoke, B.C.
E. Foley-Bennett, President, Board of Trade, Penticton, B.C.
Thos. Bulman, Okanagan Dev. & Orchard Co., Kelowna, B.C.
Arthur Barnard, Dist. Fruit Growers' Assoc., Notch Hill P.O., Blind Bay, Shuswap Lake, B.C.
Gardiner W. Boyd, Board of Trade, Bassano, Alberta.
Don H. Bark, State Engineer, Irrigation Investigation, Boise, Idaho.
W. F. Brett, Fruit Growers' Association, Armstrong, B.C.
J. Robert Brown, Indian Agent, Summerland, B.C.
W. D. Brent, Central Okanagan Land Co., Kelowna, B.C.
James Creighton, Penticton Farmers' Institute, Penticton, B.C.
W. A. Cameron, Water Rights Branch, Naramata, B.C.
James Craig, Naramata, B.C.
R. S. Conklin, Reeve of Penticton, B. C.
C. H. Cordy, Board of Trade, Summerland, B.C.
F. W. Crandall, Agricultural Association, Gleichen, Alberta.
J. J. Carment, City of Kamloops, B. C.
Arthur Chamberlain, Board of Trade, Kamloops, B.C.
D. Cameron, Vancouver Branch, Canadian Society of Civil Engineers and Corp. of North Vancouver, 1001 Rogers Bldg., Vancouver, B.C.
G. R. Castner, Fire Blight Inspector, Penticton, B.C.
H. R. Carscallen, Canadian Society of Civil Engineers, Calgary, Alberta.

R. A. Copeland, Central Okanagan Lands, Ltd., Kelowna, B.C.
Edward M. Carruthers, Belgo-Canadian Fruit Lands, Kelowna, B.C.
J. F. Campbell, Central Okanagan Land & Orchard Co., Kelowna, B.C.
F. C. Chappell, Ellison Pure Bred Live Stock Assoc., Kelowna, B.C.
J. C. Dufresne, Executive, Western Canada Irrig. Assoc., Penticton, B.C.
Edgar W. Dynes, Local Secretary, Western Canada Irrig. Association, Penticton, B.C.
E. M. Daun, Board of Trade, B.C. Hydrographic Survey, Acadia Bldg., Kamloops, B.C.
E. Davis, Water Rights Branch, Victoria, B.C.
Dr. C. W. Dickson, Executive, Western Canada Irrig. Assoc., Kelowna, B.C.
W. C. Duggan, City of Kelowna, B.C.
Jno. Davidson, Westbank Farmers' Institute, Westbank, B.C.
Hon. Price Ellison, Minister of Finance & Agriculture, Victoria, B.C.
J. W. Eastham, Dept. of Agriculture, Vernon, B.C.
P. H. Eraut, Corpn. of Dist. of Penticton, Penticton, B.C.
S. T. Elliott, Board of Trade, Kelowna, B.C.
W. J. Elliott, Principal, School of Agriculture, Olds, Alberta.
Mrs. W. J. Elliott, Olds, Alberta.
P. E. French, Asst. Prov. Horticulturist, Salmon Arm, B.C.
Wallace Flanagan, Board of Trade, Bassano, Alberta.
Jno. Faulkner, Westbank Farmers' Institute, Westbank, B.C.
L. Fetherstonhaugh, Westbank Farmers' Institute, Westbank, B.C.
W. H. Fairfield, Supt. Dominion Experimental Farm, Lethbridge, Alberta.
Mrs. W. H. Fairfield, Women's Civic Club, Lethbridge, Alberta.
G. H. Feldtman, Penticton Fruit Growers' Union, Penticton, B.C.
H. W. Grunsky, Water Rights Branch, Victoria, B.C.
Francis W. Groves, South Kelowna Irr. Co., Ltd., Kelowna, B C.
David Gellatly, Okanagan Irr. & Power Co., Gellatly, B.C.
Chas. B. Gordon, Kettle Valley Ry. Co., Penticton, B.C.
James Goldie, Okanagan Centre, B.C.
H. H. Evans, Okanagan Centre, B.C.
Ben Hoy, Horticultural Branch, B.C. Government, Vernon, B.C.
Arthur Hooker, Sec'y, Inter. Irrigation Congress, Calgary, Alberta.
Walter Huckvale, Cypress Hills Water Users' Association, Board of Trade, Medicine Hat, Alberta.
Mrs. Arthur Hooker, Inter. Irrigation Congress, Calgary, Alberta.
W. F. Hicks, Supt. Operation & Maintenance, A.R. & I. Ry., Lethbridge, Alberta.
E. C. Hunt, Horticultural Branch, B. C. Government, Grand Forks, B.C.
Geo. Harcourt, Deputy Minister of Agriculture, Edmonton, Alberta.
A. H. Huntly, Farmers' Institute, Penticton, B.C.
N. M. Hayes, Westbank, B.C.
D. W. Hays, Executive, Western Canada Irrig. Assoc., Medicine Hat, Alberta.
Mrs. D. W. Hays, Medicine Hat, Alberta.
G. N. Houston, Dominion Govt. Irrig. Office, Calgary, Alberta.

Wm. Humstane, Cent. Okanagan Lands Ltd., Kelowna, B.C.
D. B. Johnstone, Agricultural Society, Kamloops, B.C.
J. R. Jackson, Minister of B.C. Legislature, Midway, B.C.
Jas. Johnston, Board of Trade, West Kootenay Farmers' Institute, Nelson, B.C.
W. A. Joslyn, Westbank Irr. Co., Westbank, B.C.
J. W. Jones, Mayor, City of Kelowna, B.C.
Mrs. Jas. Johnston, Women's Institute, Nelson, B.C.
E. B. Knight, White Valley, Vernon, B.C.
Dr. H. Lawrence, Penticton Fruit Growers' Union, Penticton, B.C.
W. J. Lloyd, Farm Products Ltd., Lethbridge, Alberta.
E. V. de Lautour, White Valley Irrigation Power Co., Vernon, B.C.
W. H. Lyne, Asst. Inspector of Fruit Pests, Vancouver, B.C.
H. C. McMullen, Board of Trade, Banff, Alberta.
W. T. MacDonald, Soils & Crops, Dept. of Agriculture, Victoria, B.C.
Ald. N. A. McGill, City of Kamloops, B.C.
Andrew McKee, Board of Trade, Bassano, Alberta.
H. R. McMillan, Chief Forester British Columbia, Victoria, B.C.
F. McVikar, Forestry Branch, Dept. of Lands, Victoria, B.C.
A. McGaw, Inspector of Indian Dept., Vernon, B.C.
K. MacLaren, Ellison Pure Bred Live Stock Assoc., Kelowna, B.C.
G. W. McLaren, Summerland Poultry Association, Summerland, B.C.
C. A. McWilliams, Board of Trade, Summerland, B.C.
M. S. Middleton, Associate Boards of Trade Eastern B.C., Nelson, B.C.
E. W. Mutch, Board of Trade, Penticton, B.C.
J. A. Martin, City of Calgary, Alberta.
J. R. Mitchell, Board of Trade, Penticton, B.C.
Andrew Miller, Industrial Commissioner, Intern. Irrigation Congress, Board of Control, Calgary, Alberta.
Chas. Murray, Commissioner of Conservation, Calgary, Alberta.
W. R. C. Morris, Actg. Dist. Engineer for Water Rights Branch, B.C. Govt., Vernon, B. C.
J. S. Moore, Peachland, B.C.
A. K. Mitchell, 229 Pemberton Block, Victoria, B.C.
Mrs. Morrington, Penticton, B.C.
O. F. D. Morrington, Water Rights Branch, Lower Okanagan Valley, Penticton, B.C.
Wm. Pearce, Dept. of Natural Resources, C.P.R., Calgary, Alberta.
Mrs. Wm. Pearce, Calgary, Alberta.
John Power, S. O. Land Co., Ltd., Penticton, B.C.
G. H. Patrick, C. P. Ry. Irr. Dept., Strathmore, Alberta.
Mrs. S. G. Porter, Calgary, Alberta.
E. F. Purcell, City of Bassano, Bassano, Alberta.
J. C. Pearson, Ellison Pure Bred Live Stock Assoc., Kelowna, B.C.
R. Pegler, Bassano, Alberta.
J. L. Pridham, Bankhead Orchard Co., Kelowna, B.C.

Guy Pearson, Central Okanagan Lands Ltd., Kelowna, B.C.
S. G. Porter, Dom. Govt. Irrigation Dept., Canadian Society Civil Engineers, Calgary, Alberta.
J. O. Robinson, Okanagan Fruit Co., Naramata, B.C.
J. M. Robinson, Okanagan Fruit Co., Naramata, B.C.
W. H. Robertson, Dept. Agriculture, Victoria, B.C.
Dr. J. G. Rutherford, Supt. of Agriculture and Animal Industry, Dept. of Natural Resourses, C.P.R., Calgary, Alberta.
N. S. Rankin, Permanent Sec'y, Western Canada Irrig. Assoc., Calgary, Alberta.
Max H. Rukmann, Dept. of Agriculture, Vernon, B.C.
C. E. Richardson, B. C. Hydrographic Survey, Nelson, B.C.
T. Roadhouse, Kaleden Farmers' Institute, Kaleden, B.C.
J. C. Reading, Dept. of Agriculture, Victoria, B.C.
H. J. Russell, *"Free Press"*, Winnipeg, Manitoba.
Frank Richardson, Penticton A. & H. Assoc., Penticton, B.C.
E. L. Richardson, Board of Control, Intern. Irrig. Congress, Calgary, Alberta.
B. Russell, Canadian Society of Civil Engineers, Calgary, Alberta.
Chas. Raley, Dept. of Natural Resources, C.P.R., Lethbridge, Alberta.
F. Reynolds, Black Mountain Water Co., Kelowna, B.C.
M. W. Russell, Central Okanagan Lands Ltd., Kelowna, B.C.
H. G. Rowley, Black Mountain Water Co., Kelowna, B.C.
H. P. Saltring, Farmers' Institute, Naramata, B.C.
H. C. Smith, Agricultural and Horticultural Assoc., Penticton, B.C.
F. T. Shutt, Dom. Chemist, Experimental Farm, Ottawa, Ontario,
G. C. Shanton, Dept. of Agriculture, Victoria, B.C.
J. M. Stevens, Penticton Farmers' Institute, Penticton, B.C.
J. R. Standon, Kaleden Farmers' Institute, Kaleden, B.C.
C. L. Smith, Agriculturist, Oregon, Wash. Ry. & Navigation Co., Portland, Oregon.
R. S. Stockton, Supt. Operation & Maintenance, Dept. of Natural Resources, C.P.R., Strathmore, Alberta.
W. E. Scott, Deputy Minister of Agriculture, Victoria, B.C.
W. J. Stephen, Principal School of Agriculture, Claresholm, Alberta
W. H. Smith, Vernon City Council, Vernon, B.C.
R. H. Struthers, Town of Bassano, Alberta.
W. F. Schell, Central Okanagan Lands & Orchard Co., Kelowna, B.C.
Ed. Smith, Westbank Farmers' Institute, Westbank, B.C.
H. Thornber, Dept. of Agriculture, Horticultural Branch, Victoria, B.C.
S. F. Tolmie, B. C. Live Stock Commissioner, Victoria, B.C.
J. D. Tompkins, *Penticton Herald*, Penticton, B.C.
N. F. Tunbridge, Board of Trade, Penticton, B.C.
L. E. Taylor, Bankhead Orchard Co., Kelowna, B.C.
A. W. Trickey, Industrial Dev. Bureau of Calgary, Alberta.
W. N. Townsend, Armstrong Fruit Growers' Association, Armstrong, B.C.
C. Varcoe, Water Rights Branch, Kettle Valley District, Grand Forks, B.C.

H. J. Wells, Naramata Farmers' Institute, Naramata, B.C.
R. M. Winslow, Dept. of Agriculture, Victoria, B.C.
L. W. Wheatley, Assistant Secretary, Western Canada Irrig. Assoc., Calgary, Alberta.
R. B. White, S. O. Land Co., Ltd., Penticton, B.C.
E. Stuart Wood, Agricultural Association, Kamloops, B.C.
D. H. Watson, Agricultural Association, Summerland, B.C.
G. D. Walters, Hydro. Surveys, Dom. Govt., Calgary, Alberta.
M. P. Williams, Okanagan Centre Farmers' Institute, Alvaston, B.C.
F. E. R. Wollaston, Coldstream Estate Co., Coldstream Ranch, Vernon, B.C.
G. J. Coulter White, Summerland Fruit Union, Summerland, B.C.
E. A. Weir, "*Farm & Ranch Review,*" Calgary, Alberta.
C. E. Whistler, Oregon State Hort. Society (Foreign Delegate), Metford, Ore.
James J. Warren, Kettle Valley Ry. Co., Penticton, B.C.
R. G. Williamson, Cypress Hills Water Users' Association, Maple Creek, Saskatchewan.
F. H. Williams, Maple Creek, Saskatchewan.
Wm. Young, Comptroller of Water Rights, Canadian Society of Civil Engineers, Victoria, B.C.
Mrs. A. T. Young, 321 Niars Street, Victoria, B.C.

CHAIRMAN: Mr. Pearce, Chairman of the Committee on Resolutions, has a word to say.

Mr. PEARCE: Your Committee beg to report progress and ask leave to sit again. We would also like to have any further resolutions handed in at once, and the Committee on Resolutions would like, immediately at the close of this session, that any of the movers or seconders who may have any explanations to point out as to their consideration, should appear before the Committee.

The following resolution was handed in to the Committee, but the Committee considered it a matter more for the convention in general to consider. I cannot find it now but the purport of it was the advisability of appointing delegates from this convention to attend the meeting of the International Irrigation Congress to be held at Calgary in October, and also I understand, the Oregon Irrigation Congress in the near future.

Mr. RANKIN: Mr. Pearce and Mr. President, it is by attending such conventions, that we are able to bring such men as Mr. Smith and others here today. That is why we ask your support for this resolution.

Mr. SMITH: Mr. Chairman, I have with me a few pamphlets dealing more particularly with the feeding of hogs and building up the dairy herd, and if any are particularly interested, I will be glad to give them copies. They have synopses of four or more lectures a little different than the one I have delivered.

CHAIRMAN: There will be a meeting of the Executive immediately following the adjournment. The meeting is adjourned until eight o'clock this evening.

Following the morning adjournment, a meeting of the Executive was held, the following members being present: Messrs. Pearce, Dufresne, Foley-Bennett, Huckvale and Dickson.

Dr. C. W. Dickson was elected to the chair and the Permanent Secretary, Norman S. Rankin, read the minutes of the Executive meeting held at Lethbridge, August 6, 1913, and also the minutes of the meeting of the Executive held at Vancouver, December 15, 1913.

Moved by E. Foley-Bennett, seconded by Mr. Dufresne, that the minutes be approved as read. Carried.

The Secretary also reported that two meetings of the Programme Committee were held at Sicamous during the month of May, 1914.

A bank balance of $1,075.84 was reported, this having been audited along with accounts and vouchers, and found correct.

Moved by Mr. Pearce, seconded by Mr. Huckvale, that the Secretary be instructed to request the Department of the Interior to furnish advance copies of that portion of the annual report containing Dr. Rutherford's address, in order that the same might be distributed to those interested. Carried.

Mr. Dufresne also led a discussion as to the advisability of withholding from publication resolutions that had not the sanction of the Association, but no motion was made in the matter.

Moved by Mr. Pearce, seconded by Mr. Huchvale, that the meeting adjourn. Carried.

In the afternoon, the delegates and visitors attended the Penticton annual regatta as guests of the Aquatic Club and the various events were followed with great interest and appreciation.

TUESDAY EVENING SESSION, AUGUST 18, 1914.

CHAIRMAN: The delegates will kindly come to order while the local secretary makes an announcement.

The local secretary, Mr. Dynes, thereupon acquainted the delegates with the arrangements made for boat sailings and informed them as to tickets and accommodation.

CHAIRMAN: Mr. H. R. MacMillan, Chief Forester for the Province of British Columbia, who was to have addressed us, has been called away and it will be impossible for him to give his paper that he had prepared for the convention, but this will be embodied in the annual report, and while speaking of him and his department, I want to call your attention to the charts and also to the mottoes on my left. These were supplied by his department, and you will find them of interest, particularly the mottoes.

Mr. MacMillan's address follows:

FOREST FIRE PROTECTION.

Mr. MacMillan: Mr. President, ladies and gentlemen,—It is unnecessary to argue the benefits of forest fire protection before a body of men dependent upon the water from mountain streams for the irrigation of their crops. The irrigation farmers of Canada and the Western States early learned by bitter experience the effect of the forest on stream flow. Old settlers in this valley have told me that the forested streams give off water gradually, delay the melting of snow and act as reservoirs holding back the run-off, so that a large proportion of it is available in times of drought. Deforested water-sheds, swept clear by fire, do not protect the snow against the early sun, nor do they absorb the falling rain; the deforested water-sheds in comparison with forested water-sheds is as a tin roof contrasted with a sod roof. The deforested water-shed shoots the rain into the valleys below, produces floods in the wet season, with their attendant erosion, destroying property. Then, when the water is most needed, the streams run dry.

In every important irrigation district of Western Canada there is, I believe, insufficient water to supply fully the land requiring irrigation. The streams all rise in forested watersheds, and should the amount of water available for summer use be reduced by destructive forest fires, the area irrigable is automatically reduced, and at the same time it becomes necessary to undertake serious expenditure for the construction of artificial reservoirs, and the control or prevention of floods. It is now realized that the regulation of any stream must be undertaken at its source by the maintenance of its forest cover.

The amount of land to be brought under cultivation in this Okanagan watershed depends largely upon whether we succeed or not in keeping the hills green.

Every possible precaution is now being undertaken to prevent forest fires. The support of the public is sought by signs and posters distributed throughout the country. No one is allowed to light a fire through the summer without a permit. A constant patrol is maintained along the railroads now constructing through extremely inflammable sections of the Okanagan watershed. Every possible source of fire has been studied and provided for.

Then, knowing that fires will occur, provision has been made for discovering and fighting them. Forest guards patrol every district. A high level trail has been constructed around Okanagan lake. Two mountains controlling a view of the whole Okanagan watershed have been connected with the district office by telephone. During the danger season, a man on duty on every mountain spots the first signs of fire and telephones its location to the nearest patrolman. The principle of fire protection is that a man can put out 100 small fires more easily than 100 men can put out one large fire. Every effort is, therefore, made to get the fire while it is small and controllable; as the value of the watersheds for irrigation increases, the measures for fire protection will be intensified. Personally, I believe that two or three million acres of forest in the stream headwaters are worth protection for their water protection value alone. There may be some persons who do not agree—to them, I wish to point out the value of the timber crop. The development of the timber industries in this district has been held

up by lack of transportation. Yet, during 1913, not an especially good year, 30,000,000 feet of timber were manufactured, resulting in a labour expenditure of $450,000 in this valley. The timber revenue to the Government from this district was in 1913, about $35,000. Timber manufacture in this district has not yet started. There is now standing here about a billion feet of merchantable forest, twice as much as is cut for lumber in a year in the whole of Canada. Such an extensive and profitable asset certainly merits protection from fire.

You, who are interested in irrigation, have been our best friends. I wish to thank you, both for your general support of forest protection and for the active measures individual companies and persons have here taken personally to prevent and control fires.

CHAIRMAN.: The two other speakers for this evening are Mr. McMullen and Mr. Houston. On your printed programme, you will notice that Mr. McMullen's name has been given first. It has been decided that these will be reversed this evening and Mr. Houston will speak first, owing to the fact that his paper may provoke some discussion and we wish to give you an opportunity to discuss it before the end of the meeting. Mr. G. N. Houston, of the Department of the Interior, Irrigation Branch, Calgary, will now address you on the subject.

THE STORAGE OF WATER FOR IRRIGATION.

Mr. G. N. HOUSTON: Mr. President, ladies and gentlemen,—Irrigation originated away back in the dawn of civilization as a matter of necessity. Just when water was first applied artificially to produce or increase the yield of agricultural crops is not definitely known, but here and there through ancient history we get glimpses of the art sufficient to indicate that it was known and practised from the earliest times.

We get a little idea of the irrigation institutions of this early period through one of the Grecian historians who gives us the first description of a storage proposition as follows: "There is a plain shut in on every side by a range of mountains and there are five gorges in the mountains. From this range of mountains then that shuts in this plain, there flows a great river the name of which is Aces; it formerly being divided into five separate channels used to irrigate the lands of the nations mentioned, being conducted to each nation through each separate gorge, but since they have become the subjects of the Persians, they have suffered the following calamity; The King having caused the gorges of the mountains to be blocked up, placed gates at each gorge, and, the passage of water being stopped, the plain within the mountains has become a sea as the river continued to pour and had nowhere an exit. The people therefore, who before were in the habit of using the water, not being able to use it any longer were reduced to great extremities; for though in winter Heaven supplied them with rain as it does to other men, yet in summer, when they sowed millet and sesame, they stood in need of water. When, therefore, no water was allowed to them, they and their wives going to the Persians, and standing before the King's palace, raised a great outcry, but the King gave orders that the gates should be opened towards those lands which were most in need, and when their lands were satisfied by imbibing water

these gates were shut, and he ordered others opened to those next in greatest need, and as I have been informed, he opens them after he had exacted large sums of money in addition to the tribute."

This little incident which took place about 2,400 years ago, shows us that even at that early date the value of storage as an adjunct to irrigation was well recognized, and incidentally that the institution of graft is not of modern origin.

In the early development of irrigation on this continent, there was plenty of water in the streams and no one thought of conserving it. Increase of population and a cycle of dry years suddenly brought the irrigator to the realization that if the water which he allowed to run past his headgate during the winter months and the flood stages of the stream, was in some manner held back and allowed to come down at such times as he needed it and in such quantity as could be handled, it would mean to him the success instead of failure of his crops.

Consequently reservoir sites were acquired and storage of water begun, In this, as in the development of all other new projects with no precedent to guide them, they proceeded with caution and bought the small basins, and constructed inexpensive dams. As the value of irrigated land increased and the demand for water became greater, the reservoirs were found to be too small and they had to be enlarged and new ones built. This necessitated the acquiring of new land, which, in the meantime had increased in value, and thus the process of development went on until in some cases they paid for the last enlargements ten to fifteen times the amount for which they could have been bought when the reservoir was first built. To a certain extent this held back the development, as many times the land had become so valuable that they could not afford to turn it into reservoir sites. A great deal of money would have been saved the settler if he had had the foresight to acquire, in the beginning, sufficient land for the maximum capacity of the reservoir.

Today no irrigation project should be considered complete until all possible storage in connection with it has been investigated, planned for, and the necessary sites acquired.

Reservoirs for collecting and penning back water for future use in connection with irrigation may be grouped into two classes.

(1) Reservoirs formed by damming the stream itself.
(2) Reservoirs located more or less remote from the stream and filled by means of a canal. Occasionally, we find a reservoir which comes under both classes.

RESERVOIRS ON THE STREAM.

This class of storage is usually located near the head waters of the stream, and in general, is characterized by a large basin with comparatively little fall from the upper end to the lower, where the stream passes through a narrow gorge used as the dam site. Within certain limits, the larger this basin and narrower the gorge, the better the site.

There are many advantages in this class of storage. Being located usually in the mountains at high altitudes, the land is not so valuable for agricultural purposes and can be acquired at a low price. These reservoirs are also valuable in

preventing floods which originate above. The flood is caught regardless of priority and turned out to earlier appropriators below in amounts which can be handled.

When a reservoir is constructed on a stream the dam must be of a very substantial type with large spillway and outlet capacity to provide for floods. This makes the construction cost high and in order to warrant the expense a large storage capacity is necessary. On account of this relation between the cost of the dam and the size of the basin the sites of this class are usually developed last, and unfortunately there are comparatively few of them.

RESERVOIRS REMOTE FROM THE STREAM.

These are usually situated on the plains near the land to be irrigated. They consist in general of large comparatively shallow basins, sometimes a natural depression and sometimes formed by an earth embankment or dam across one side of the area. As these reservoirs are filled by a canal from the stream their value depends to a great extent upon the capacity of this inlet ditch. Unless there are sufficient reservoirs on the head waters of the stream to control the flood and let it down gradually it is evident that this inlet ditch must be of a capacity sufficient to fill the basin during the run of high water. Unfortunately the flood period in the arid districts is of comparatively short duration. Hence it requires in many cases, very large inlet ditches.

Since the inflow to these reservoirs can be regulated by the headgates on the stream very little spillway capacity is necessary unless the site has a large drainage area above it. The outlet works need to be only of a capacity sufficient to supply the ditches below.

These conditions coupled with the fact that there is nearly always at hand at these sites plenty of material with which to build a good earth dam, makes the cost of construction of this class of storage less expensive than if constructed on the stream. On the other hand the area flooded by this class of reservoirs compared with their capacity is usually much larger than in the case of mountain storage, resulting in a comparatively larger loss due to seepage and evaporation.

If the headgate of the intake ditch is located below any part of the irrigated land, the waters returning to the stream from this land will compensate to some extent for this additional loss.

With regard to seepage from these reservoirs, it is not only the value of the water lost which must be considered, but also the value of the land below the reservoir, which is rendered useless for cultivation from this cause. The amount of seepage depends upon the depth of water in the reservoir and the character and formation of the material constituting the basin. It will therefore be evident that in order to determine with any degree of accuracy the amount of the land which will be water logged or alkalied as a result of this seepage as well as its position below the reservoir, it would be necessary to make exhaustive test wells on the site and also for some distance below it.

As this adds to the expense of building, it is usual to confine this investigation of the geological formation to the site of the dam only, and then take such precautions during the construction as the conditions indicate will render loss from this cause a minimum.

If the water stored carries salt or clay the tendency is for the seepage to become less as this suspended matter is deposited over the bottom of the basin.

In the case of irrigated lands situated near the mountains and obtaining their water from the streams whose source is the melting snow, this class of reservoirs has a marked advantage over the other class in that the holding of the water in the shallow basins for some time before applying to the land raises the temperature so that it retards to a less extent the growth of the crops. Reservoirs of small capacity can be advantageously used on the farm to store the night run of water. In some systems it is the custom to waste this into a coulee or if this is not possible the farmer must irrigate night and day until he has finished, but with a small reservoir he can turn the water into it at night and use double the amount next day.

The reservoir site having been selected, the next important matter is the dam There are four general types of these, characterized by the material of which the bulk of the dam is constructed, viz: earth, timber, loose rock and masonry dams.

The choice of one of these types will usually depend upon the following conditions:—

(1) The amount of money available for the work.

(2) The character of the materials near the site which can be used in the construction.

(3) The character of the foundation.

(4) The depth of water it is supposed to pen back.

When the Persian King, of whom Herodotus wrote, constructed his dams and gates to pen back the waters of the river Aces, it is probable that the designer planned the most efficient and permanent structure known at that time without considering the element of cost. The problem which usually confronts the engineer of to-day however, is to build the most efficient and most permanent structure possible for a limited sum of money.

This introduction into the problem of the element of minimum cost has had a marked effect upon the design of dams in recent years. It has forced the profession out of the rut of building expensive masonry dams depending upon their weight alone for stability, and has been the cause of the development of many new forms, notably those whose strength depends largely upon their arched shape.

In considering any material for dam construction, there are three elements to be taken into account.

(1 Impermeability or water-tightness under pressure.

(2) Its power of resisting the water pressure stored behind it.

(3) Its permanency when in place.

EARTH.

Earth is one of the commonest materials suitable for dam construction, and hence there are more dirt dams in existence than any other type. Earth is not water tight, that is, water will pass through it at varying rates depending upon

the size of the particles and the pressure. It may be made practically water-tight however, by selecting the material and compacting it thoroughly during construction. Where the materials are at hand for the purpose the upstream face may be covered with a mixture of clay, sand and gravel called puddle, forming a practically water-tight curtain. This puddle is often placed in the body of a dam as a vertical core wall. Concrete and other masonry is sometimes used in the same way. In hydraulic fill dams an impervious core of fine clay is deposited in the centre and the coarser materials nearer the outer edge by the action of the water.

However, the usual method when reasonably good material is available, is to build the dam of practically the same material throughout, that is without resorting to artificial mixtures for faces or core wall. When properly used it is one of the best and cheapest materials for dams.

The usual cross section of an earth dam is a very flat upstream slope depending upon the character of material in the dam. This usually varies from 3½ to 1, to 5 to 1. A down stream slope from 2½ to 1, to 3 to 1, crest 16 feet, free-board 10 feet. The tendency in America is to make the upstream slope steeper and endeavour to protect it from ware action by reinforced concrete paving. In some cases this has not been found satisfactory, but it should be very efficient if properly designed.

While timber is adaptible to dam construction as regards water-tightness and strength, it is more or less perishable unless completely submerged, and therefore is not generally used in important dams, but is confined to low diverting weirs and temporary structures. The writer has seen however, several timber crib dams, which were in a fair state of preservation after twenty years.

LOOSE ROCK.

Where good earth is not available loose rock is next higher in order of permanency and cost. In general dams of this character consist of a mass of loose rock of varying size, dumped on the dam site, and brought to uniform slopes on either side. A water tight curtain is constructed on the upstream face or in the body of the dam to hold back the water. This curtain may be made of earth, concrete or masonry, steel plates or timber. Dams of this character are well adapted to isolated mountain sites where earth is not available in proper quantity or quality and where the cost of cement for a masonry dam would be prohibitive.

MASONRY.

Up to the early nineties the best quality of Portland cement used in Canada and the United States was manufactured abroad, and its price ranged from $2.50 to $4.00 per barrel. To-day we can buy higher grade Portland manufactured at home for a price ranging from $1.00 to $2.00 per barrel. It has also been demonstrated that Portland cement can be re-ground with 50 per cent to 60 per cent of certain classes of rock, without materially reducing the strength. Hence masonry construction can be considered to-day, in connection with dams, where a few years ago it would not have been thought of.

The older masonry dams were build with stone laid in cement mortar and frequently faced with cut stone masonry. To-day, however, concrete seems to be the favourite material.

Yard for yard the most economical form of concrete construction is what is known as "Cyclopean Masonry." It consists of massive concrete in which is embedded large irregular pieces of rock. In case the materials are limited, or for any other reason, it is desired to reduce the amount of concrete, steel rods may be inserted forming reinforced concrete which is one of the most valuable of modern building materials, when properly used, but one of the most dangerous when in the hands of the inexperienced or unskilled.

FOUNDATIONS.

Solid rock foundation is the most desirable for masonry dams, although not necessary for the reinforced concrete dams of the Ambursen type.

Loose rock dams can be built upon good earth or rock foundation. Earth dams are most adaptable to earth foundations; if care is used in bonding they can be built upon rock. Soundings should be made on any proposed dam site to determine what the character of the foundation is for at least a depth below the surface equal to the depth of water to be stored, unless it is in solid rock. Many failures of dams can be traced to the lack of this investigation.

LIMITING THE HEIGHTS OF DAMS.

Earth limited in good practice, from 100 to 125 feet. Loose rock dams about the same. Masonry dams, the limit at the present seems to be about 325 feet.

Priority of appropriation and beneficial use are considered the foundation principles upon which irrigation law and its administration is based. As storage of water for irrigation purpose developed, it was recognized that these principles would have to be modified somewhat. To take a simple case, suppose there were four appropriations from a certain stream for direct use through ditches. The fifth appropriation is for storage. Appropriation No. 6 is for direct irrigation.

If the principle of first in time, first in right, providing the water is put to beneficial use, be applied to this case, No. 5 will begin filling his reservoir as soon as the first four appropriations have their full supply. No. 6 will be obliged to wait until the reservoir of No. 5 is filled before he can get any water. By that time his crops may be ruined. Any water coming down later is of no use to him nor can it be stored, as the reservoir of No. 5 is filled, hence it would be wasted, thus defeating the purpose for which the storage was provided, viz.; conservation. In order to meet this condition the law recognizes two classes of beneficial use, viz.; immediate and deferred. It is assumed that water delivered for direct irrigation is to be applied immediately, and therefore should take precedence over storage rights, hence all laws governing this point usually provide that no water shall be delivered to reservoirs for storage until all demands for direct irrigation have been satisfied.

The greater part of the water which can be stored in northern climates runs off during the high water flow of May and June. If the right to store water is granted, independently of direct irrigation rights, as is usually the case, there will come a point in the development when the two will conflict.

This occurs about the time when the direct appropriations plus the appropriations for storage equal the average run off during the cropping season. As soon as the total reaches this point any further appropriation for direct irrigation, will, in low water years, have to be supplied from water which has usually gone into reservoirs. As direct appropriations increase as the water available for storage becomes less and less, and the land depending entirely upon reservoirs for water will suffer

In some quarters the practice of fall and winter irrigation is increasing and under the plea of direct irrigation, is demanding water which has heretofore been used for storage. In the state of Colorado, these conditions have reached a climax. Direct appropriations have been granted to such an extent on some streams that they not only encroach upon storage water in low water years but threaten it in average years and, if continued, is looked upon by owners of reservoirs as a menace to their property. Remedial legislation has been suggested seeking to place storage and direct irrigation rights on an equal footing. This would appear to be a step backwards and result in endless litigation. A better method would be to limit the appropriations from any stream to a quantity which it could furnish in at least three out of five years and to consider all applications of water to land between harvesting in the fall and seeding in the spring, not as direct irrigation with preferred rights, but as a form of storage to be taken from the stream in its order of priority with reservoir water.

We have been lavishly wasteful of natural resources, but we are just entering upon a period in the economic history of civilization which is to be characterized by conservation. Irrigation offers a large field for the application of this principle. The farmer who applies the water to the land, the engineer who designs the structures, and those who frame the laws under which the operation of irrigation systems are carried on, should labour with a common purpose of making every drop of water do its share in crop production, and to this end, the storage of water will be a most important one. (Applause.)

CHAIRMAN: Some time now will be devoted to discussion, if there are any questions or points any of the delegates would like to bring up in connection with the paper.

Mr. CRANDALL: I would like to ask Mr. Houston, if he has had any experience in storing water in reservoirs and on an average, about what percentage of waste or seepage do you figure that you are going to run up against.

Mr. HOUSTON: That is very difficult to answer off hand, because it depends entirely upon the character of the earth or reservoir site. If it is sandy, fifty per cent may disappear before the irrigation season is over, that is, actually lost. In other cases, the usual in arid areas, at altitudes of about 6,000 feet,

would be something like a quarter of an inch a day. That is a little heavy perhaps.

Mr. CRANDALL: I would like to ask further the advisability of storing wherever it is possible to store, water that comes from mountain streams from a source of snow or ice, and also as to moderating the temperature before using it upon the soil or crop.

Mr. HOUSTON: I do not know that I quite understand the question. You wish to know the benefits which comes from storage of water from snow?

Mr. CRANDALL: So far as moderating its temperature before being used.

Mr. HOUSTON: If stored the temperature would be raised according to the length of time, and if the reservoir were in the form of a shallow basin, with a large area exposed to the sun, the temperature would be raised very materially up to as high as probably 65 to 70 degrees.

Mr. DON H. BARK: I should like to ask how much evaporation loss takes place from the ordinary reservoir and as to how that would compare with the loss in evaporation tanks usually used for determining the evaporation of water.

Mr. HOUSTON: I don't know that I have accurate data, but I know this; that the evaporation from a reservoir surface will usually be more than from a tank, because it is subject to different conditions It usually gets the currents of wind and air, where over a small pan for evaporation, it is more or less protected.

Mr. BARK: On the other hand, a small tank three feet in diameter and two feet deep, becomes much warmer.

Mr. HOUSTON: Is it not usually the case that they place the tank in the reservoir itself? That has been my custom wherever measuring the evaporation independent of seepage. We would immerse the tank itself in the reservoir and endeavour to keep the two the same temperature.

Mr. BARK: How does that evaporation from that tank suspended in the reservoir compare with the evaporation of the tank in soil. Is it more or less?

Mr. HOUSTON: I do not know that I have had an opportunity of comparing the two. You would have to, of course, place the tank you were comparing very close to the reservoir banks in order to get the same conditions as far as possible. I would think if investigations of that kind are going to be carried out, that the tank had better be immersed in the reservoir itself. Of course, you have to contend with the matter of waves slopping over in the pan.

Mr. CRANDALL: In irrigation systems where the water is secured by flooding, there is usually a large amount of silt carried in solution. Now, my experience

has been that when this water is stored in reservoirs, you lose a large amount of this silt for actual use on your land. Is there any portion of that carried in solution, which is not discernible beyond the reservoir usually, that would be beneficial to the crops?

Mr. HOUSTON: The amount of silt which is carried, I think, in the ordinary system, would be rather insignificant in the matter of the development of the crops, but anything which was in solution, any vegetable matter in solution in the water, would naturally go on to the fields and be used to increase the fertility if that was the kind of material it was; but clay in suspension when it gets to the reservoir, will settle, except the very finest of the clay. Usually there is a very fine material in reservoir water that does not usually settle on the land. The water will wash away more than you put on.

CHAIRMAN: If there is no further discussion we will call for the next item on the regular programme, and this item you will find will be one of the treats of the Convention. I will ask Mr. H. C. McMullen, late General Live Stock Agent, C.P.R., Alberta, to speak to us concerning.

LIVE STOCK ON AN IRRIGATED FARM.

H. C. McMULLEN: Mr. President, ladies and gentlemen,—One would need to be an inspired poet, or a very skillful word painter, to do full justice to the marvels of beauty contained in this delightful city and valley selected for the sittings of the Eighth Annual Convention of the Western Canada Irrigation Association.

I desire to take advantage of this occasion to extend my sincere sympathy to those who are so very unfortunate as to have been deprived of the privilege to-day conferred on us, of feasting our eyes, and delighting our souls, in the great natural beauty of this district.

"Okanagan," "Penticton," these be names to conjure with, and when we gaze upon the waters of your lake, lying, like a sheet of molten silver, in the shadow of those grim and towering peaks, standing sentinel-like to guard the destinies of a happy contented, and progressive people, we cease to wonder at the unanimous action taken at the close of the Convention held in the city of Lethbridge last year, when Penticton was chosen as the meeting place for the Congress of 1914.

And I may say that this is no disparagement to the beautiful and progressive City of Kamloops, which was your only competitor for the honour of entertaining this the Eighth Annual Convention of delegates from perhaps the most important organization in Western Canada.

Irrigation as an aid to success in solving some of the many problems confronting the man engaged in agricultural pursuits, has come to be recognized as an exact science, and, the farmer who is ambitious for results, and honestly desirous of obtaining the best net returns from his land and labour with the minimum of uncertainty, must be equipped with the most up-to-date knowledge,

and methods, obtained as a result of actual experiment and demonstration by those who have given of their thought, time, and means to arrive at conclusions.

The average farmer is too busily engaged in the consuming task of making a living for himself and family to engage in experimental work; he is perforce obliged to defer to the opinions of men who, perhaps by reason of longer experience, or more favourable circumstances, or who through a system of organized effort have been enabled to arrive at demonstrated facts.

He must also largely depend on the assistance of the Government bureaus, and departmental officers to secure such information of a practical nature as will eliminate many of the risks he would otherwise be compelled to take, and, while I shall have something to say a little later about the matter of Government assistance I desire to say here and now, that, never in the history of the world, has there been as much work of value, done by the National, State, Dominion and Provincial authorities as is being carried on to-day.

The function of such an organization as this, I take it, is to gather and disseminate information that will be available and of practical value to the every-day farmer, who is in a measure shut out from the sources of knowledge open to the organized forces of this Association, and, we are here for the purpose of presenting such known facts as pertain to the science of irrigation in the light of new discovery, also to discuss the best means of applying the methods incident to an old practice.

It is a recognized fact, that the value of any idea lies wholly and entirely in its application; this is a hackneyed expression, but nevertheless most worthy of serious and continued consideration, and, the man who accepts this and combines it with his business will secure the best and most lasting results; as an idea, or discovery, is in itself valueless, its worth lies in the use we make of it.

It is not difficult to find today, men who are imbued with the idea that irrigation is a more or less modern practice, some going even to the length of dubbing it, a new-fangled fad, but there could be nothing further from the truth or more at variance with the facts.

Irrigation has been practised successfully for thousands of years, and we have historical evidence, that, not only has there been more satisfactory results obtained in crop returns than is possible in humid regions, but, that, under this system fertility of the soil has been conserved to a greater degree. These statements are substantiated by a series of statistics gathered by the Department of Agriculture in the United States, and show average yields during a period of forty years. I am not going to quote these figures as they are readily obtainable in the form of departmental reports.

There is however another phase of the question that should prove of supreme interest to the investigator, and to the student of political economy. The highest civilization of the past has always been found in irrigated sections, as witness Palestine, Syria, Persia and India.

In Asia Minor and Central Asia we find the remains of great cities, surrounded by ruins of irrigation works. In the new world, the Incas developed the western slope of the Andes. While in Mexico the high civilization of the Aztecs was developed on the arid plateaus of that unhappy country.

It may be asked why these attempts to conquer the arid wastes by irrigation failed. Was it because of the failure of the soil to produce, or was it because the demonstrated richness of the people attracted the attention and avarice of the warlike invaders? The comparatively recent action of the Spanish conquerors of the Aztecs in Mexico and the Incas in Peru is suggestive of the true story.

In Japan where the farmers realize that the crop must be irrigated, and the land fed, irrigation has been practised for more than four thousand years. The late Professor F. H. King in "Farmers of Forty Centuries" says, Japan produced and applied to her fields, in 1908

23,850,295 tons of human manure,
22,812,787 tons of compost,
753,074 tons of commercial fertilizer (imported),
1,404,000 tons of fuel ashes,
10,185,500 tons of green manure products, grown on hill lands.

All of this was applied to 14,000,000 acres of cultivated fields, and, it should be emphasized that this is done because as yet she has found no better way of permanently maintaining a fertility capable of feeding her teeming millions. What is the answer? Japan is not a meat eating country as the term is understood by us, there is practically no live stock owned or bred in the Orient. Horses are not extensively used as a means of transport in a country where the value of a man lies in the width of his shoulders and the strength of his back giving him the ability to carry a load, or run in a jinricksha.

As a result of these conditions the farsighted Orientals, recognizing the value of irrigation as an aid to intensive cultivation, are also seized with the necessity for conserving the fertility of their soil, to the end that the unborn millions may not perish from the face of the earth.

In the absence of live stock as a source of natural fertilizer these people have for centuries supplied the deficiency by the use of artificial or commercially produced plant food, and, in the light of their experience we may well ask ourselves the question "What would have been the result in that densely populated land had the 'little brown man' pursued the selfish method so common to certain sections of our own rich and productive country?."

Admitting as all thinking men do, that fertility must be conserved, there remains only the question, "How best to accomplish this with the least outlay and the best returns?."

Irrigation applied scientifically as it is now done, is beneficial in any phase of agriculture, this is a demonstrated fact, but it is not the only fact of interest to the properly constituted husbandman. In the application of plant food, whether in the form of natural manure, or commercial fertilizer, there has not yet been discovered any method whereby one may secure such an equitable distribution of the necessary constituents as by the even flow of irrigation waters.

In the matter of selection of fertilizer, so vitally necessary in sustaining the life of a farm, I do not know of any two systems or branches of agriculture that could be more profitably and logically connected, than the growing of grains, fruits, and fodder plants, together with the breeding and feeding of live stock,

the one is absolutely dependent on the other, and as the results attained by men thoroughly versed in this practice have demonstrated that maximum production of fodder plants have been secured on irrigated farms, it would seem there should be no difference of opinion on this point, but apparently there is, or else there is in many cases an indifference that is difficult to explain.

Agriculture is an exact science the laws governing which are inexorable. The man who follows this rule and observes these laws is the only man who can or will be the successful farmer. It does not matter what branch he follows, he must of necessity lead his business along the lines of least resistance as demonstrated by the success of others.

Few men will have the temerity to dispute the assertion, that irrigation as a practical science has been of incalculable benefit to the agriculturalist, but, there may, and, no doubt does exist, a difference of opinion, as to how, and, under what conditions the greatest value may be derived from that practice.

I contend, and, I believe I can demonstrate that the man who applies it to straight grain growing, or for that matter, to the production of any one crop, to the exclusion of others, will make a financial failure, will become an agricultural bankrupt. We have perhaps not attained to an age, when, we can say with any degree of justification that this is true in Western Canada, but, we have had the light of many years experience shed on this question through the results obtained in some of the older states to the south.

Students of ancient and modern history are agreed that the men who have been and now are engaged in farming either on an irrigated farm in the arid districts or in humid sections of the country, and who are attempting to carry on their business without devoting a part of their time and energy to the breeding and feeding of live stock, are making a mistake that many prove well nigh irreparable.

I am prepared to admit without argument that there is a tendency to be constantly preaching to the farmer, to be offering him gratuitous advice on how to conduct his business and I do not wonder they sometimes get impatient, and, are inclined to ask why, if we are possessed of such an intimate knowledge of how these things should be done, we do not go out and plow a few acres ourselves? I have however, no doubt that, from the farmers standpoint, there is ample warrant for such question. But on the other hand, as I have before remarked, the farmer, as a rule is too busy making a living to give any time for investigation and research, and so it devolves on the business man, who makes his living off the farmer, to study these questions and publish the results of his studies, to the end that the source from which he draws his sustenance may be able to continue in his role of wet nurse.

In other words we do not want the fountain to go dry, and selfish as this may appear to the farmer we are really conferring a distinct benefit on him while protecting ourselves.

Running the entire gamut of agricultural endeavour, I do not know of any one question in which we as individuals, the business community, the State, the Nation and the World at large are more vitally interested than that of conservation of soil fertility, and I am frank to say, it is one question which a great many of our farmers seem to consider of the least importance.

Fertility is something that cannot be seen. If it could I am quite satisfied there is not one man in ten thousand who would have the hardihood, or apparent lack of intelligence to destroy it, and cart it off to the market and dispose of it as he is doing in many cases today.

That is the trouble, fertility is hidden, there is nothing tangible which appeals to the average man, nothing which may disappear in an instant leaving behind an obvious void. No, the process is more subtle than that; there may be a succession of diminishing crops as a reminder that something is wrong, but no actual hiatus to be filled immediately by the expenditure of time, labour, or money. The average business man engaged in manufacturing, milling, or packing house production, will, the minute his raw material commences to get low, in his coal sheds, his ore bins, or lumber piles, take measures to replenish the supply; if he failed in this his entire plant would lie idle and unproductive and he would be drawing on his capital to keep the business going.

The fertility of the soil is the raw material of the farmer, his cattle, his grain, his fruits and vegetables are his finished product, and, if he sends his finished product to the market without taking proper measures to replenish his supply of raw material, he will soon find himself in the awkward predicament of being obliged to draw on his capital to keep his farm going. Unconsciously he may do this and fool himself into thinking he is selling only his finished product, but the day of reckoning will surely come, and he will pay in smaller and smaller returns for his policy of waste. I sometimes think that this is not altogether unconsciously done. There is a streak of selfishness in most of us. It is developed to a greater degree in some men than in others, but in none is it more harmfully shown than in these pirates of the soil, these grain robbers who take all and leave nothing for those who come after. We have no right to rob posterity and I cannot but admire the man who has sufficient good red sporting blood in his veins to take some chances, and who will put back in the soil a fair proportion of the yield which has cost the land its life blood to produce.

It is an elementary truth that everything of value in this world comes from the soil, and if I were today advising a young man about to choose a profession, or an occupation, to select for himself some line of endeavours in which he was going to expend his talents, and to which he would devote his life, I do not know in all honesty of intention, that I could direct him to one so likely to prove agreeable and remunerative as agriculture properly followed, but, I would insist that the young man make it a part of his investment, his daily, weekly, and monthly effort to so balance the production of his farm that at least one half of the output would be marketable livestock. It is hardly necessary to repeat, but I state it as a fact, that, in England where the land has been farmed successfully for centuries that the production of live stock has always been the important part of the farmer's business. When some of us who are here today were chasing buffalo, and later cattle, in this country twenty, thirty or forty years ago, the farms were old in England, and they are producing more today per acre than they did one hundred years ago.

It is an essential part of every lease, and land contract executed in that country that the lessee binds himself to maintain a certain number of the various kinds of livestock so that the fertility of the soil may not be jeopardized. He

dare not sell or dispose of a single load of manure. That is why they are still raising crops in old England that yield largely in excess of those produced in our new western provinces.

A great deal of our land is virgin yet, but it never saw the day it would produce the crops they are raising in England year after year. I contend we cannot afford, as a nation, province, city or town, to take the chances we are taking today. The farmers of this country are intelligent. It is either thoughtlessness or selfishness or a mixture of both that is to blame for such conditions, but the agricultural community of the west has been awakened to a proper sense of responsibility in this matter, and with the insistent demand now prevailing for marketable livestock I confidently look for an early reversal of conditions which has become alarming.

It is hardly practicable to say just how many cattle, horses, sheep, or swine should be maintained on any given area of land; that is a matter which must be determined largely by local conditions. The man on the land is the man who knows best what the land will sustain.

We come now to the question of fodder for the stock. What fodder crop is the most suitable, and profitable? What will show the best returns in growth and food values for the least cost and exertion?

There are a number of fodder plants, all of which will grow in abundance in Western Canada, and each of which has proved its value on the farms of the older provinces, but I must confess that I am prejudiced in favour of good old alfalfa. The legumes are soil builders, they are all nitrogen feeders, so, it follows naturally, that, if nitrogen is the body of your soil, the plant that will gather and distribute, and retain in your soil the most nitrogen, and will at the same time build up your growing stock, and fatten your matured ones, is the fodder plant for you. We have our choice of a number of good ones but alfalfa has stood the test so successfully, and under such a variety of conditions, that I am inclined to take the same view of the plant, as did the parson who dining with one of his flock, declared of the dessert "doubtless God could have made a better berry than the strawberry, but, doubtless God never did."

One of the most remarkable instances of the variety of uses to which this wonderful plant may be put, occurred under my own observation many years ago down in the then Territory of Utah. The firm of Crawford, Thompson Crocker and Booth, large cattle breeders and dealers, a firm which occupied in that day, only in a smaller way, about the same position, filled by our old friend Pat Burns in this country today, owned twelve miles of water front on Bear River, from which they bred, grew, and fed, practically all the beef supplies for the markets of Utah, Wyoming and Colorado. They also handled the pork and pork products supply for the same territory, all of which, however they were obliged to import from the packing house districts of the Mississippi and Missouri valleys where hogs were selling at that time at about $4\frac{1}{2}$ to 5 cents per pound while we bought the finished product for 35c per pound or three pounds for a dollar.

I may say that about that date, the early Seventies, the only hog to be found west of Grand Island Nebraska, was an educated pig performing at one of the theatres at Salt Lake City.

Harvey Booth, one of the firm, and a man with imagination, chafed under a condition he seemed powerless to change, and with a natural bent for investigation and experiment, one day suggested to Thompson, the senior member of the firm, that they could raise their own hogs and so escape the enormous profits exacted by the middleman, increase their own profits, and at the same time reduce the price to the consumer.

Mr. Thompson was very sceptical and inquired how Booth proposed to feed and fatten his hogs. We would as well bring in Chicago bacon as Illinois corn, he said. Booth persisted however, and declared he could raise alfalfa on the Bear River bottoms, and as he had been told that hogs could be finished on this plant, he proposed to try it. If the crop matured and it was found that they could not make bacon with it, they could at least finish their cattle on it and improve the quality of their beef.

The result fully justified Mr. Booth's experiment, and I want to say that I never saw finer hogs than were turned off the feed yards of this firm, and they were finished on alfalfa hay.

This was the beginning of the alfalfa cultivation in the west, and fully demonstrated the value of this wonderful plant on an irrigated farm.

All through Utah, through southern and western Wyoming over into Idaho, and down to Colorado, the idea grew and spread, until hundreds of ranchers, there were no farmers in that day, profited by Harvey Booth's experiment, and almost every little mountain stream in the country was pressed into service and put to work irrigating an alfalfa field.

From this beginning grew the vast system of feeding camps that now dot those old cattle states, the value of which output runs into millions. In Bitter Root valley in Montana there has been established the greatest alfalfa feeding district in the west, cattle and sheep being shipped in from all over the state, until there are now wintered and finished each year, about ten thousand cattle and one hundred thousand sheep.

After all this talk about alfalfa, let us see what the actual figures show, figures collected and verified by the Department of Agriculture in Washington. These people do not deal in generalities, but by a system of experiments and carefully checked results are in a position to say just what will be the outcome of any particular course of feeding.

We will take beef at 6c. per pound, alfalfa will bring you $20.16 per ton at present prices, timothy will bring $9.80. Alfalfa will yield three tons per acre, or a return of $60.48 in feeding value; as against this timothy will yield one and one half tons per acre giving a return of $14.70. In favour of the alfalfa you have $45.78 over and above the profit you would make on the timothy.

The food value of one ton of alfalfa equals that of one ton of wheat bran, which is acknowledged to be a very strong ration; it has the additional advantage of causing a much greater flow of milk, it is more palatable than bran, and an acceptable food means a contented cow, and you dairymen know the worth of that.

Now about the life of alfalfa, I presume that there are men in this audience who have forgotten more about alfalfa than I know, but I have taken some pains to gather the facts in this connection and I have indisputable evidence,

that the average life of an alfalfa field under proper conditions is seven years, I have known fields that were not ploughed up in forty years and were still producing, but this is not the ideal condition, as a field is apt to become sod bound if not broken up at regular intervals. However, we have evidence that this is not a short lived crop.

In all my experience in the west I have not seen land or climate better adapted to the growth and production of alfalfa than the valleys of British Columbia, and with our mild winters, and nearby markets, I would say conditions were ideal for successful breeding and feeding of livestock.

There is another point I wish to dwell on for a few minutes, that is the value of irrigation as a home builder. Just picture to yourself a farm of not over one hundred and sixty acres situated in one of the many beautiful valleys of this province, a farm well fenced, and divided into a dozen different fields, with a comfortable house, and a well built barn, necessary outbuildings, with a tree shaded walk or drive leading up from the road, with a few flower beds, and some shrubbery about the house to give an air of homelikeness to the place, with a few good horses in the stable, and some fat cattle in the corral, with a pen full of sleek Berkshires, or Chesters laying on fat for the fall killing, with the barnyard full of Leghorns or Minorcas, and over all the purring sound of the life giving water as it flows through a network of ditches to give strength and vigor to the growing crops. Is not that the kind of home to inspire patriotism in a man, the kind of a home for which a man would fight? the kind of a home that makes a man love his country and his flag. No man ever volunteered to carry a gun in defence of a boarding house. I am a great believer in the virtue of the home. No country ever attained to greatness unless the superstructure was reared on the solid foundation of homes.

A comfortable home means a contented man, a happy woman, smiling, healthy, joyous children, and, did it ever occur to you that it is almost impossible to build up such a home as this without some good live stock on it. The deadly monotony of a grain farm has driven more boys to the city, and more girls to the department store than any other factor within our knowledge.

And your boys! there is a problem if you please. How are you going to keep your boys on the farm? How keep them happy and contented, with a sustained and growing interset in their work. It is your sacred duty to create such an atmosphere of home comfort and personal liking for the business as well as implant in your boy a counteracting influence that will overcome the primal wanderlust which is an inherited tendancy in every normally constructed boy.

The hateful monotony of ploughing and seeding, with the nerve destroying wait for harvest time, with resultant periods of comparative idleness, never fails to breed discontent, while the vivid imagination of a red blooded boy, given free rein is apt to run riot, and the so called joys of city life, appealing to him as the one thing to be desired warps his judgement and destroys his loyality, ending in desertion and possible wreck of what might have been a useful life.

Now I want to say for the average farm boy, that, given proper conditions and environment, there is no more loyal, faithful and industrious soul on earth, but remember always, he is human, and just a boy.

Fifty years ago, before the age of thousand acre farms, and commercialized agriculture, before the era of steam ploughs and machine made crops, the boy was an important factor. He was born and reared on a hundred, or two hundred acre farm, a farm that was a home, a farm cut into small fields with a meadow, always there was a meadow, where after the haymaking, the horses were turned into pasture, with a wood lot where the dairy cows, and the loose stock ran during the summer; there was a little flock of sheep, grazing on the roadside, or later in the stubble fields, and following the fed stock there was always a nice bunch of growing pigs, while in the pens waxing fat would be found a half dozen two hundred pound porkers grunting with pleasure as little Jimmy made his morning and evening rounds with the feed pails; and last but not least there would be Jimmie's calf that was his very own, the calf that he watched as it grew, the feeding and grooming of which gave him much personal pleasure, and the colt that was his, how much of joy he derived from the feeding and care of old Lucy's foal, and when the time came for harnessing and breaking, the pride and satisfaction that were his was reward sufficient to compensate for it all.

This was the kind of a farm that held the boy, and this was the kind of a boy that proved a real blessing and a comfort to his parents in their declining years, and who when he had followed them to the little country church yard, took up as his life work the duties and the management of the old farm, and then prepared to rear his own family, but without the livestock you cannot have such farms and you cannot have such boys.

There is another phase of this question that is of universal interest, and should be of supreme importance to the agriculturist; I refer to the annually recurring labour problem. Wherever exclusive grain growing is practised labour trouble is always present. Not necessarily from a difficult or discontented labour element, but from inability to secure sufficient help to do the work of harvesting at the proper time. The inability to get men to plough your fields when they should be ploughed, the difficulty in getting help to clear weeds, and, I will come to that again, there is no man carrying on the operations necessary on a diversified farm, who ever has these labour troubles. If he is a bachelor, and he should not be, he can usually exchange work with his neighbours, but most of the men who have such farms and homes as I am picturing are not bachelors; they have two or three husky boys growing up, who, with the diversified farms of work on a mixed farm and the care of the growing stock, take such an interest in their daily tasks that labour troubles do not enter the scheme of things at all. The officers of the railway companies, and the officials of the Dominion and Provincial Government Bureaus, are each year greatly concerned as to how and where best to distribute the labour necessary to harvest and care for the ripening grain crops.

Even with the most elaborate and scientifically accurate reports there will be an unequal and unworkable distribution of labour. Grain will ripen unevenly, certain districts will experience a drought, or other such unusual conditions as will quickly change the outlook, and render useless all these carefully prepared reports. This frequently results in the congestion of labour in one district with corresponding scarcity in another.

Your representatives at the capitals of the country, and the heads of the transportation companies are doing everything humanly possible to solve this

labour problem for you, and yet you know what occurs almost every fall; there is either a surplus or shortage of labour.

In old Ontario and the older farming districts of the United States where the average farm is not more than one hundred and sixty acres they are always able to take care of their work, but there has been no time since I have lived in the prairie provinces when I have not heard a wail, about either too many men or not enough. The solution of this difficulty lies in reasonably small farms devoted to the production of diversified crops, and all the live stock that the land will support.

I think perhaps sufficient time has been devoted to the question of the advisability of going into the live stock branch on the farm, and I would now like to say a few words on the possible returns to the farmer, what is likely to be the amount of his profit on his land and labour as against the one crop system.

Aside entirely from the value of live stock as a fertilizing agent on the farm, and their worth as destroyers of noxious weeds, apart from their humanizing influence on the farmer and his family, there is undoubtedly large profit to be made in breeding and feeding any or all classes of live stock for the markets of today.

With the steady growth of population, with the building up of numerous and vast centres of manufacturing and industrial activity, there is a consequent narrowing of the available pasture lands and feeding grounds all over the civilized world. This has had the effect of so enhancing the market values of all classes of live stock and their products that a steady and permanent market is provided at vastly profitable figures. The day of the 4c. steer and the 5c. hog has passed and can never return. The industrial, mechanical, and professional population of the world are non-producers, and must be fed by the men who are content to pass their lives in that cleanest, most healthful, and self satisfying of all pursuits, agriculture, and those of you who have chosen that, and adopted it as your life work need have no fear of over production ever interfering with or lowering your profits below the level of a fair remuneration for your investment and labour.

The Province of Alberta produced and marketed during the year 1913, $15,000,000 worth of poultry, milk, and milk products, while the hog crop brought in $6,000,000. There was realized from cattle $9,000,000 and from horses $2,500,000, but I am sorry to say the best friend the farmer ever had, the poor despised, unlovely, maloderous little sheep contributed only $500,000 for mutton and $200,000 for wool.

However, here is a nice little balance on the credit side for the farmers of Alberta; $33,200,000 from the live stock they said a few years ago would not pay.

As an instance of the respect in which the live stock industry is held by the farmers of Kansas, I am going to quote you the figures for the year 1912 as showing the relative values of farm products for that state and year. There was produced and marketed field crops and products to the value of $216,000,000, while the live stock alone realized the enormous total of $225,000,000. These are significant figures and are perhaps a true indication of why Kansas today takes rank as the most prosperous of the agricultural states of the Union. Of

course it is just possible their state wide prohibitory law may have had something to do with this condition, but regardless of that they just keep on raising their steers.

This is all an argument in favour of increased production of live stock on the farm, but, with the acceptance by the farmer of the doctrine of improved methods in this direction, there yet remains much to be done before the conditions will become ideal.

After the farmer has succeeded in bringing his land up to a high standard of production and has stocked his farm to the limit of maintenance, there comes the very important question of how and where best to dispose of his output, and this is largely a matter of organization.

Organization is the prime factor in marketing livestock, and all the products of the farm. You will all recall the early struggles of the fruit growers of California in their efforts to market the crops with any profit to themselves.

They found themselves in possession of perhaps the richest section of fruit growing land on the continent of America. They had the very best transportation system and facilities possible to build and equip. They had growing markets almost at their door and yet they found themselves facing a deficit every year. Why was such a condition existent in a land favoured as California was?

Someone figured out that if they got together they might discover the leak. A meeting of the growers was called to devise ways and means for remedying the trouble, and in the resultant discussion, it was found, instead of their methods being wrong, there was no method at all. Each fruit farmer was attempting to dispose of his crop independently of his neighbour. Each shipper sent his output to the market that struck his individual fancy, and no regard whatever was paid to the requirements at different points.

If one car of oranges would take care of the market at a given point, it was quite likely three would be sent, and in all lines similar instances of lack of method were found.

Immediately the fault was located, a strong committee was formed to effect an organization which should have complete control of the selling end. A home office was opened, an expert employed and an efficient staff installed, whose duty it was to gather information, and make daily returns to the shipping agent, all shipments being based on telegraphic reports of market conditions.

The result was almost instantaneous, and highly gratifying, and today there is no more effective or profitable selling agency in the world than the Fruit Growers Association of California.

One of the most remarkable instances of the value of organization is shown in the work of the International Institute of Argiculture. This idea was born in the brain of a man who questioned the equity of treatment accorded the agriculturist in the matter of marketing his produce. David Lubin of California, himself a farmer, conceived the idea of a world wide organization, having for its sponsors the governing powers of pratically every civilized nation on earth, and for its object the gathering and dissemination of such information covering crop conditions, and market requirements, as would render harmless the combination of market riggers, whose object in life was to prey on the producer.

How well he succeeded is now a matter of history, although scarcely ten years have elapsed since the first meeting and orginanization was effected in the Eternal City.

I now want to say a few words about the remarkable growth of Departmental and Institute work, as carried on by the governments of almost every agricultural country in the world.

This work has been the subject of a great deal of hostile criticism, largely for the reason that, as a rule, experimental farms cannot be made to show a profit, but in many cases have to face an annual deficit. It has been argued by the critics of the system that to be of any material benefit to the everyday farmer, such stations should make a profit on the investment, and so set an example to the agricultural community on practical lines.

There would, perhaps, be good and sufficient ground for such criticism if the net result of such work were to do the same thing, and produce the same effects, as the practical farmer, only in a more expensive way, and, at a greater outlay of money. But that is not the object or practice of the various schools of the science of agriculture and the experimental farms, but rather to discover new and better methods of doing the same thing, also to learn how not to do things. As this is all in the nature of experimental work, and necessarily expensive, we cannot hope to make such work immediately profitable, except by the dissemination of the knowledge so gained, and the community is benefited by the increased returns and the greater prosperity of our farmers.

These departmental experiment stations are also doing a great work in securing greater efficiency in the fight being waged against the spread of noxious weeds, and if their efforts in this direction shall have increased the output of the farm by 5 per cent the result will have amply justified their existence.

In summing up I would say, assuming that farming is a pleasant occupation, how can you make it profitable ? Assuming that it is profitable, how can you increase your profits ? If it is profitable are you making the profit at the expense of the fertility of the land ? If you do not keep live stock, or the proper number on your farm, what are you doing to enrich the soil and to avoid stealing the birthright of posterity?

If you are engaged in agriculture in either a humid region or an irrigated district, and are producing the maximum field crops, and the number of finished live stock, are you organized against the manipulation of your markets, and to provide a fair return for your labour and investments?

If you are deficient in any of these essentials it is high time you were taking stock and improving your methods.

In conclusion I would say,breed and feed all the live stock your land will maintain, breed good stock, the best you can, but breed stock.

Thank you Mr. President, ladies and gentlemen. (Applause.)

CHAIRMAN: The meeting will now adjourn until two o'clock to-morrow afternoon.

WEDNESDAY, AUGUST 19, 1914.

At 8 a.m., the delegates and friends assembled to partake of the hospitality of the Kettle Valley Railway Company, the President, Mr. James J. Warren, having arranged an excursion in accordance with the programme. Owing to lack of time, a portion of the trip had to be omitted, but the journey was greatly appreciated and on the return of the delegates, Reeve Conklin voiced a unanimous vote of thanks for the courtesies accorded.

Dr. Shutt, Dominion Chemist, "caught in the act"—along the Kettle Valley Railway.

WEDNESDAY AFTERNOON SESSION, 2 p.m.

CHAIRMAN: The meeting will kindly come to order and while you are arranging yourselves comfortably, the Secretary will read a little bit of war news.

The first item on our programme this afternoon will be an addresse by Mr. Don H. Bark, in charge of Irrigation Investigations, Boise, Idaho. Mr. Bark was on the programme, you will notice, earlier, but as he could not get her as soon as he originally intended, it was necessary for him to come on later. Mr. Bark will address you on the subject of

THE ACTUAL PROBLEM THAT CONFRONTS THE IRRIGATOR.

Mr. Don H. Bark: Mr. Chairman, ladies and gentlemen,—The problems that confront the irrigators of the northwestern part of the United States are many in number and varied in nature, and as conditions here are more or less similar, there is no doubt but that the irrigators of the Canadian Provinces have or will encounter the same difficulties as their neighbours across the border. There are all kinds of irrigation projects in all of the various stages of development in the western part of the United States, and there is no doubt but that a detailed discussion of the methods that have been evolved for the solution of the many problems would be interesting and beneficial to the irrigators of Western Canada, but time will not permit. I have, therefore, decided to discuss the problems that have and now confront us under three main heads.

(1) The problem of learning how to properly prepare, plant, care for and irrigate a farm.

(2) The problem of securing finances with which to tide the irrigator over the lean period that almost invariably exists between the time the farm is first settled upon and the time it is producing profitable returns.

(3) The problem of marketing the crops that are ultimately produced at a profitable figure.

PREPARATION AND CARE OF AN IRRIGATED FARM.

The first problem, that of knowing how to properly prepare a farm, and how to care for, and operate it after it is prepared, is thought by most new irrigators to be the sole and only problem that will confront them. The past experience, however, of thousands of our irrigators has proven that the problem is not yet half solved when the farm is all in crop.

Other serious problems are bound to confront them either singly or collectively.

SELECTION OF A FARM.

Great care should be used at the outset in selecting an irrigated farm. Many types of soil and topography lend themselves quite readily to irrigation, but the best soil, however, and the one which works most easily, is a soil of a medium sandy loam nature of at least four feet in depth before a porous gravel, or an impervious stratum, is encountered. A medium sandy loam soil will absorb water readily, cultivate easily and will not dry out quickly after irrigation, while the heavy clay loam soils do not cultivate easily, and do not absorb water readily enough. The porous, gravelly soils on the other hand absorb water too easily, require irrigation oftener, and a larger amount per irrigation than the heavier soils, due to the losses of irrigation water which take place through deep percolation. The growing of green manure crops, or the application of barnyard manure to either the heavy soils on the one hand, or the coarse porous soils on the other hand, materially improve their mechanical condition so that they will not only produce larger crops, but they will produce them with less work and less water. The humus from the manure or from the crops that have been turned under render the porous soils more impervious, and the

At work on Kettle Valley Railway Grade (C.P.R.) near Penticton, B.C.

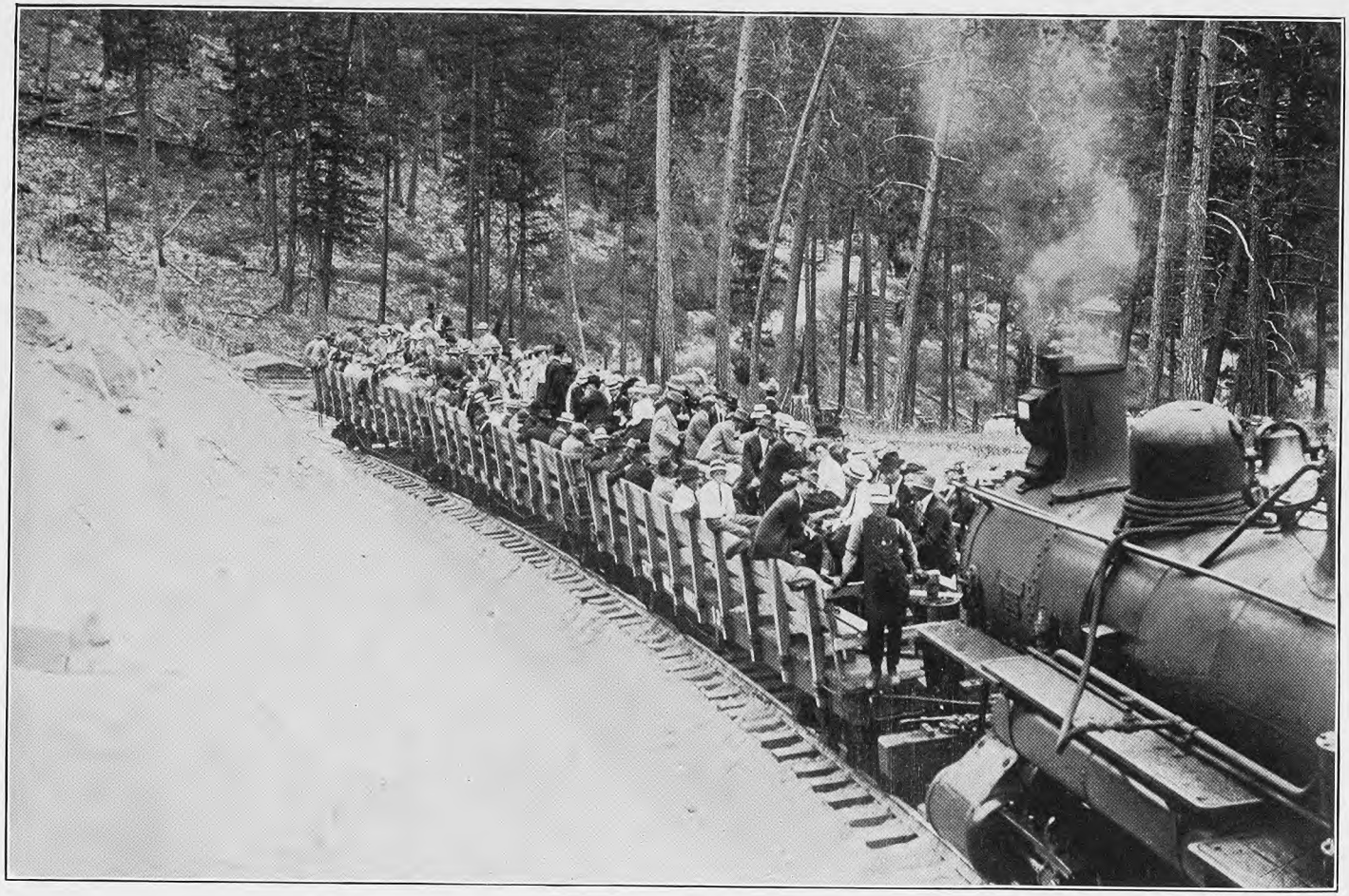
impervious soils more porous, thus better adapting them for irrigation farming.

The topography of an irrigation farm plays a most important part in the ultimate success of the operator. It is a common fault with many settlers from the eastern humid regions to pick out a farm that is too flat, having too small a slope to render irrigation easy. The other extreme of too great a slope is also quite as serious, for the water requires more attention and more skillful handling on the steeper slopes in order to prevent erosion. It is believed that while slopes ranging from three or four feet per mile to as much as four or five hundred feet per mile can be irrigated, the ideal slope of an irrigated farm with medium soil lies between 20 and 50 feet. With this slope less levelling of the land is required and water can be supplied more rapidly and with less attention than with either the flatter or the steeper slopes.

The new farmer should also pay particular attention to the accessibility of water for his farm. Land within a reasonable distance of the source of supply should be selected, and not where long lines of flumes or heavy fills are necessary through which to convey water to it. The adequacy and constancy of the water supply should also be investigated. The amount found necessary will depend considerably upon the climate and the nature of the soil. For diversified crops on the average soils of Idaho, Colorado, Oregon and Washington, it has been found that at least two acre feet must be delivered within the four months irrigation season beginning May 1st. Cooler climates and higher altitudes will undoubtedly require less, while lower altitudes with longer seasons or more porous soils will undoubtedly require more.

Too much stress cannot be placed upon the benefits that are derived from careful preparation of the land for irrigation. It is safe to say that not over one acre out of every ten now irrigated in the United States is prepared for irrigation in the best possible manner. It will be admitted that this is a sweeping statement and one that will not be believed by all irrigators, but it is unquestionably true. Land should be so prepared, whatever irrigation system is used, that the irrigation water may be supplied evenly to its surface, for without even application there is either waste of water and time, or loss in crop production. In all of my experience I have never found an irrigator who admitted or complained of the fact that he had spent too much time or money in the preparation of his land for irrigation; the other extreme almost invariably obtains. Time does not permit a detailed discussion of the methods that should be recommended for the preparation of the land, but it is safe to say that there is but little land that lies so well but that from ten to twenty-five dollars per acre could profitably be spent in fitting the surface for the proper application of irrigation water. More failures are due to improperly prepared land than to any other one thing, when it could so easily be done at the start by the farmer's own men and teams if too much were not attempted at the outset.

It is a common practice throughout the west for the new as well as the old irrigators to attempt to farm too much land. Forty acres well and intensively farmed is frequently more remunerative than a quarter section poorly farmed. This is well illustrated by the fact that the average production of irrigated alfalfa in Idaho as shown by the 1910 census was only 3·26 tons, while the yield of the first crop (there being three crops) at the Gooding Experiment Station



Delegates' excursion over Kettle Valley Railway, near Penticton, B.C.

during 1914 was $3\frac{1}{2}$ tons of cured hay per acre, showing what care and intelligent application of water will do where the owner or operator is not farming more land than he can carefully care for. The irrigation farmers of Idaho and of the west in general are almost invariably endeavouring to operate too much land.

The farm ditches should be well and carefully made. Under the present practice in the Northwest they are almost universally too small to convey an adequate irrigation head with safety. Careful attention to this matter will frequently greatly increase the net profits that are derived from the farm.

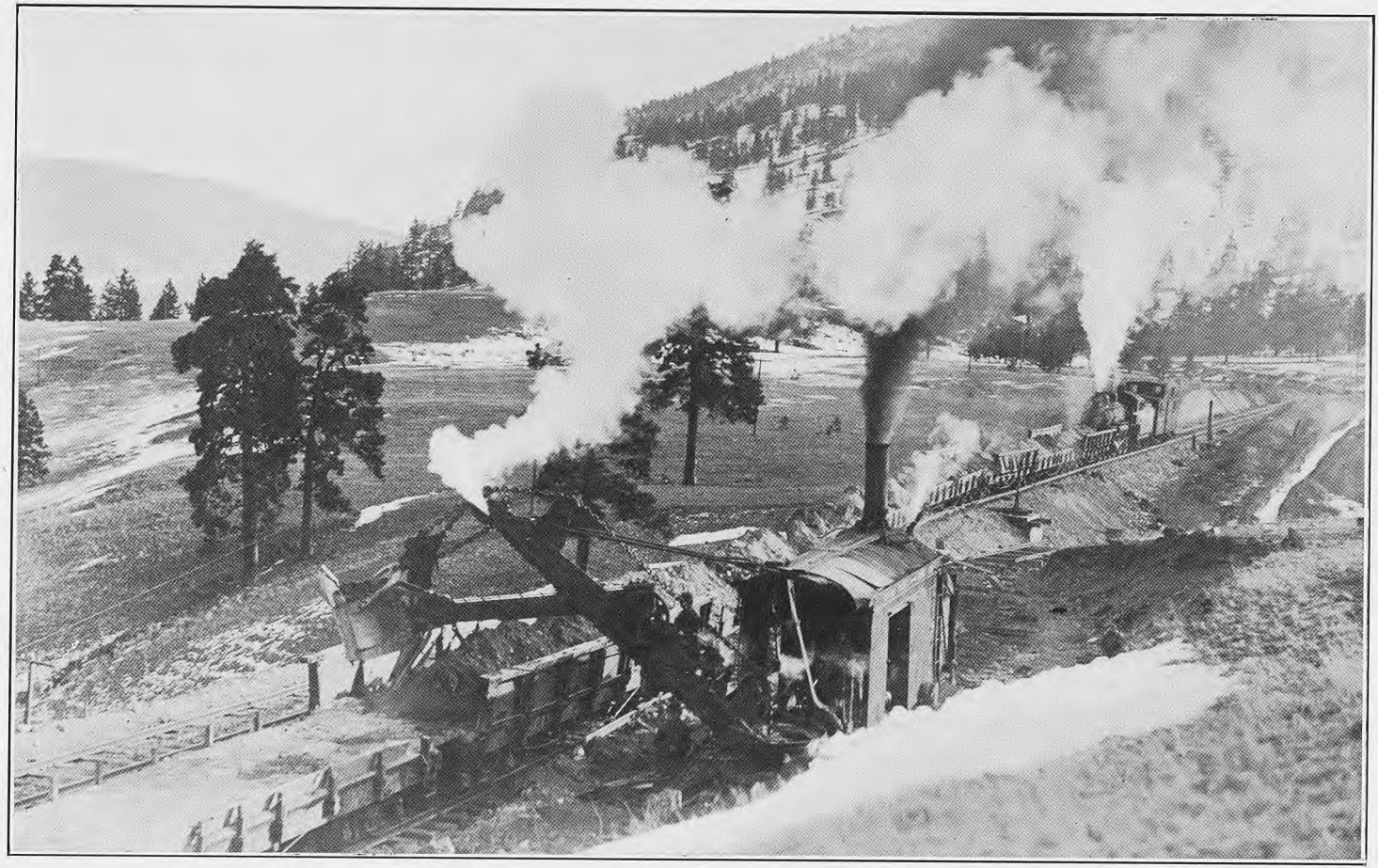
Outside of the sugar beet growing districts, or the citrus belt of California, there is usually too little attention given to the preparation of the seed bed. All crops will normally respond better if planted in a carefully prepared seed bed, and if possible there should be sufficient moisture in the soil at the time of planting to bring the crop up. Outside of alfalfa, the clovers, and other natural grasses it rarely if ever pays to irrigate the crop up. It is better practice with the grains and potatoes to irrigate the soil first and plant the crops afterwards if there is insufficient moisture to bring them up.

CROP ROTATION.

In most arid regions where irrigation is necessary the soils, though containing a sufficient amount of mineral plant food to last for years, are deficient in nitrogen and in humus. Rotation of crops such as will supply nitrogen and improve the mechanical condition of the soil is, therefore, absolutely necessary for the profitable and economical operation of an irrigated farm. Normally alfalfa is the best basis for crop rotation and soil improvement. Stock feeding is also very essential for the ultimate success of the irrigator on any normal project. The normal arid soil because of the deficiency of nitrogen will not produce more than three successive profitable crops of grain or potatoes. The third or fourth season's grain yield where no alfalfa has been grown, or no fertilizer applied, frequently falls as low as 15 bushels per acre, while hundreds of instances may be cited of wheat having produced three successive crops averaging from 60 to 75 bushels per acre after alfalfa or clover has been turned under after it has been grown for three years.

WHEN TO IRRIGATE.

Grain requires its maximum irrigation from the flowering to the soft dough period. Potatoes seem to require a moderate but uniform moisture content in the soil from the time the young tubers begin to form until they have reached their maturity. Alfalfa on the other hand has a tendency to produce the most crop where the most water is applied, although the increase that is made in the yield of the alfalfa after a depth of from two to three feet per annum has been applied is rarely proportional to the increase that must be made in the amount of water that is applied. Water should never be allowed to stand on alfalfa and a uniform moisture content should be maintained in the soil from the time the alfalfa has attained a height of six inches in the spring until the last crop of the season has been cut.



Steam Shovel at work on Kettle Valley Railway, Penticton, B.C.

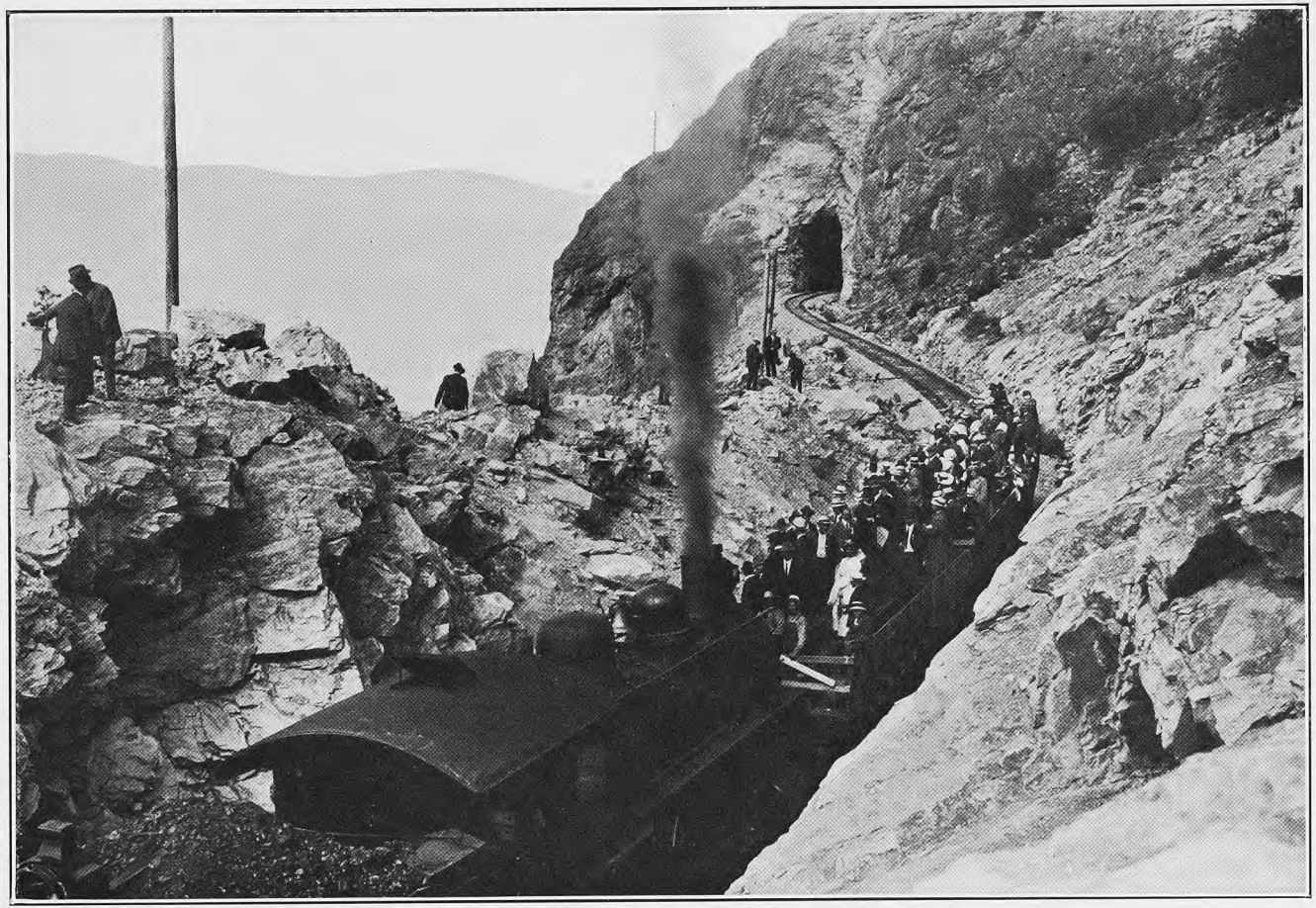
AMOUNT OF WATER REQUIRED.

A comprehensive investigation of the water requirements of soils and crops has been carried on in Idaho under my direction during the past five years and indicates that grains and all cultivated crops in general, including potatoes and orchards, require 1·5 acre-feet per acre during the season if planted on medium clay loam of four or more feet in depth. Alfalfa, the clovers, and pasture, planted on the same type of soil have been found to require almost twice as much as the grains, or 2·5 acre feet per acre. The latter class of crops. however, do not require any more during the same length of season than the grains. The extra amount is required because of their longer growing season. The average annual precipitation of the localities investigated was about 12 inches, of which one-third occurred during the six growing months.

FINANCIAL ASSISTANCE USUALLY NECESSARY.

The second problem outlined at the beginning, that of securing sufficient finances with which to tide the irrigator over the lean period that almost invariably exists between the time when the farm is first settled upon and the time it is producing profitable returns, is most certainly one of the most serious problems that confront the irrigators of the northwestern part of the United States. The majority of the settlers on the new projects have started out with little or no experience, and with too little money. The land was always raw, necessitating a considerable expenditure at the outset for the clearing and levelling. An initial payment of about $3.00 per acre had to be met. A house of some kind also had to be built, and the interest and the deferred payments had to be met each year. Then, too, because of insufficient finances and need for immediate money, a great incentive almost invariably existed for hasty and careless preparation of the land. Alfalfa in many instances was not planted for the first year or two, as it seemed imperative that some grain crop be planted that would unquestionably find a ready market before the end of the first year. The yields, because of the hasty preparation of the land, have in a large number of cases been disappointing. The prices that have been received for the crops have also been low, due to the local over supply that is usually caused when so much new products are thrown on a partially developed market. The facilities for handling the rapid increase of the products of a new locality are sometimes far from adequate.

Due to the large initial expense which must be borne by the irrigator, to the many payments that must be met and to the glutting of undeveloped markets, there has usually arisen on most new projects a serious need for credit. This need usually exists for at least five years after a project is inaugurated. This problem has never yet been successfully solved in our northwestern states, for the banks have never been sufficiently strong in the new localities to take care of the legitimate needs of the irrigators. I am informed that this problem is being experienced and that it is being solved in parts of the Canadian Northwest as the irrigation company has in many cases been financially able to take



Delegates' excursion over Kettle Valley Railway, near Penticton, B.C.

care of the just needs of its settlers at a reasonable rate of interest. I do not mean that money should be loaned to all settlers indiscriminately, for every settler on every project is not financially responsible, but it seems highly desirable at this time that every settler that needs financial assistance, and that has the necessary security in the form of livestock, land or crops, should be able to secure a reasonable amount of funds at a reasonable rate of interest with which to help to tide him over the lean period that almost invariably exists for the first few years on every normal irrigation project.

PROFITABLE MARKETING.

The third problem that has been mentioned is that of finding a profitable market for the crops and products that are ultimately produced on the farms. This is the problem that is now confronting many of the older and better irrigation projects throughout the Northwest. The early settlers of these projects rarely realized that such a problem would ever confront them, but to many it now seems to be the only problem, for the crop production has increased so much more rapidly that either the markets, the transportation facilities, or livestock consumption, could possibly take care of them, that the consumers have been at a serious loss to know what to do with their excess crops. The solution of the problem seems to be:

(1) The careful and systematic diversification of the crops of the farms as well as of the projects, so as to furnish no more products at any one time than the railroads can haul, or than the markets can take care of.

(2) The raising of more and better livestock in sufficient numbers to consume the majority of the excess products of the farms, thus concentrating the more bulky products in order that they may be able to stand the long and expensive freight hauls from the interior.

(3) The selling or the distribution of the products through co-operative organizations similar to the organization that is selling and distributing the products of the Southern California citrus orchards so successfully.

Many new projects during the first few years of their history have produced so much hay that they could not dispose of it at a profitable figure. Some of these growers have gradually plowed up their alfalfa and rotated their crops and have begun raising potatoes, clover seed, sugar beets, etc. Others have secured enough hogs, sheep, beef cattle, or dairy cows to consume all of their products. The fruit and potato growers are marketing their produce through co-operative organizations which aim to decrease the cost to the consumers, and increase the producers' profit. The factors just mentioned tend to diversify the interests and solve the last and apparently the most serious problem that has confronted the irrigators on our large projects.

In closing, I wish to emphasize the desirability of selecting a good farm with medium soil in the beginning; of the fact that careful levelling and preparation of the soil pays big returns on the investment; that diversification of crops and crop rotation are highly important; that some means should be taken by the irrigation company to finance the legitimate needs of the irrigators during

Lady delegates to the Eighth Annual Convention, Penticton, B.C., August, 1914, at Tunnel Mouth Kettle Valley Railway.

the early stages of the project; and that the irrigators should early realize the necessity of providing for the disposal of their crops either through the feeding of livestock or the efficient distribution of their well diversified products to a market which is able to handle them at a price that is profitable to both the producer and the consumer. (Applause.)

CHAIRMAN: I am sure we have all listened with a great deal of interest to Mr. Bark's address. We will now devote a little time to discussion if any of the delegates wish to bring up any questions.

Hon. PRICE ELLISON: Did the state consider the vested right of the first holders on record?

Mr. BARK: I am awfully sorry and ashamed to tell you that they did. We hope some day that that will be changed, but our state law is based on the beneficial use of water and states that a man cannot use more water than he can put to beneficial use. It seems to me absurd to give a man to the exclusion of others, the right to the use of water twenty or twenty-five feet deep. (Applause)

Hon. PRICE ELLISON: With regard to the six inches you spoke of applying, was the orchard bearing?

Mr. BARK: Yes, sir.

Hon. PRICE ELLISON: About what would be the age?

Mr. BARK: Eight years old. It produced three hundred boxes of fruit to the acre last year and in four years' time that orchard had a total of one foot deep of water applied, not every year, but in four years. The fruit sold for a dollar a box.

CHAIRMAN: What was the rainfall ?

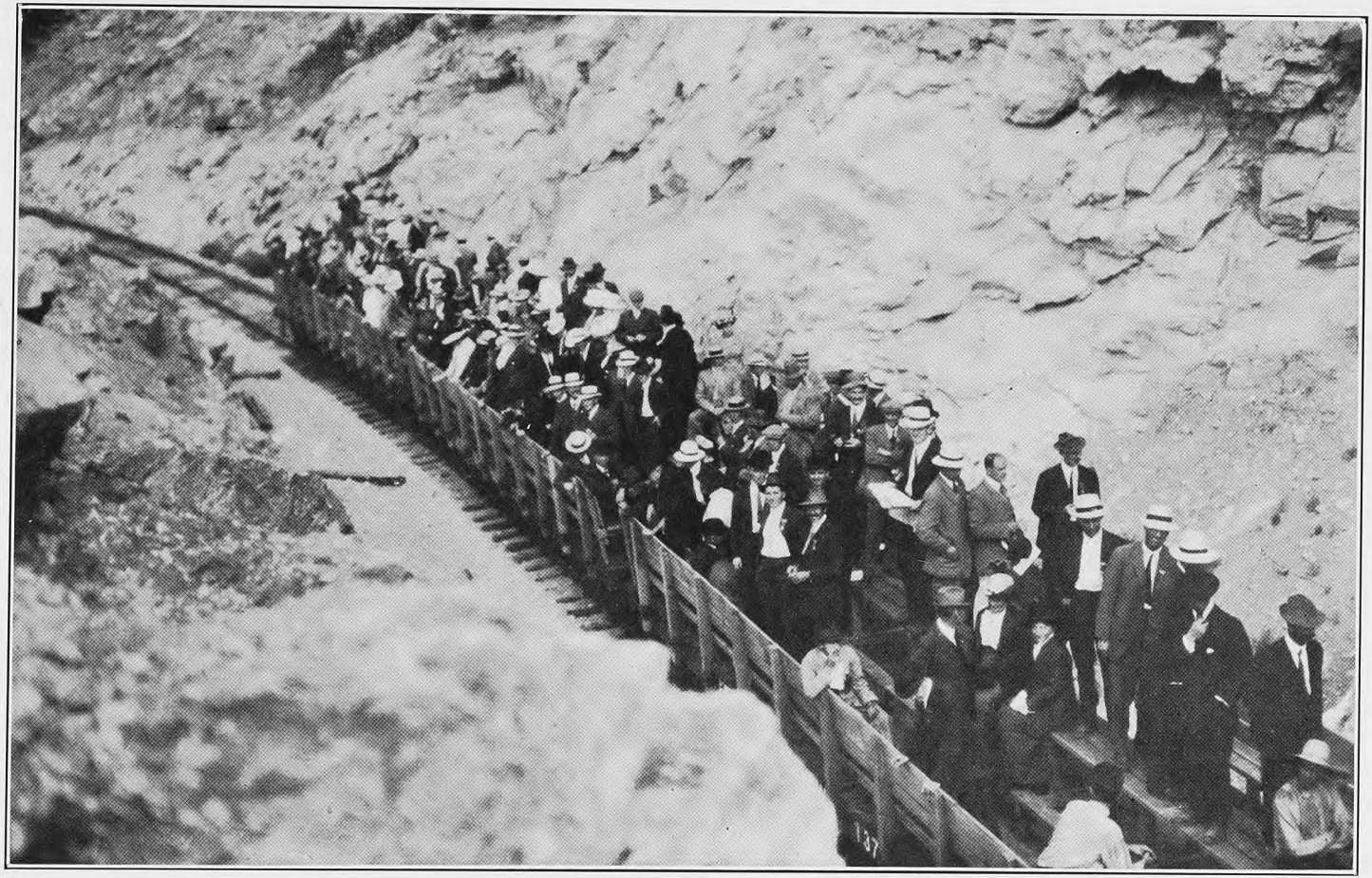
Mr. BARK: About twelve inches a year. About four inches for the six growing months and eight for the six winter months.

Hon. PRICE ELLISON: What would be the effect of a gravel soil on the water ?

Mr. BARK: It would have required more water on account of being lost through deep percolation. Probably a foot deep a year would answer, with careful husbandry. Our irrigation season is about 120 days.

Mr. CRANDALL: Do you find after the land has been irrigated a number of years that it requires the same amount of water as at first.

Mr. BARK: It does not require as much water after a few years, but I have found out something very striking about that. It is not due very considerably to the soaking up of that soil but to the improvement of the mechanical condition and fertility of the soil.



The Delegates' Excursion over the Kettle Valley Railway, Penticton, B.C.

Mr. CRANDALL: How deep does the average alfalfa root penetrate ordinary soil?

Mr. BARK: It has been stated that some plants have gone down sixty to eighty feet, although I have never dug down to see. (Laughter.) I have seen places, however, where the roots were twenty to thirty feet deep. I think, though, that six feet of the alfalfa roots are all that are doing much good.

Mr. CRANDALL: May I ask if you find clay is of sufficiently heavy substance to prevent penetration by the roots?

Mr. BARK: Not clay, but hardpan or impervious calcareous shale; but it would have to be very refractive clay to stop the growth of alfalfa. If the clay is porous so that the water can get in, the alfalfa will bore its way through very dense clay.

A DELEGATE: I would like to ask what you consider the minimum and maximum slopes for satisfactory irrigation.

Mr. BARK: I'd hate to have a field of mine slope more than one hundred feet to the mile, and the minimum slope should be something like five feet to the mile. You can irrigate, if nicely prepared, on a slope of five feet to the mile, but it takes a better level. One hundred feet to the mile for good big farms is enough. I saw hills this morning being irrigated that had probably five hundred feet to the mile (laughter) but you cannot farm a big alfalfa field and a big grain field in that way and be very successful, because it takes too much time to irrigate. You must be careful or you will wash the hill away.

Mr. KNIGHT: How would you arrange your supply of water if you had alfalfa in an orchard?

Mr. BARK: Well, I would prepare the ground much better if I was not putting in a cover crop, and I would never plant an orchard unless I could put in a cover crop, because you must do that to put nitrogen in and get a good yield. I would irrigate, I think, in the same way as other alfalfa fields. I think I would furrow it with corrugation furrows running right down with the tree rows.

Mr. KNIGHT: Would young trees get too much water then?

Mr. BARK: They would be liable too, but I would not keep the alfalfa in the orchard permanently. I would not put alfalfa in a single orchard; I would put in red clover, because you can kill that out easier, and it is hard in this country to kill out alfalfa. I saw one fellow who had tried to kill his patch and when I remarked that he had lots of alfalfa, he said? Don't talk about it. I am sick of it.' He had plowed it up in the fall and spring and in August he was grubbing it with a grubbing hoe. (Laughter.) The clover will do just as much good and is easier to kill out.

Mr. TAYLOR: You mentioned the matter of too much moisture in the fall, winter killing alfalfa. Is that not contrary to the usually accepted idea?

Mr. BARK: There is just a little leeway in that. I have seen alfalfa positively winter killed by being too dry. I like it rather moist, but you don't want to irrigate it and have it freeze up that day. The evaporation is low at that time of year and if it freezes up, it sometimes winter kills for that reason. Normally I would like a lot of moisture in the soil.

A DELEGATE: A speaker here said he put clover and alfalfa in as a cover crop. He did not cut it all and it required no more water. How do you find that?

Mr. BARK: Was he a big fellow. (Laughter.) I cannot see how that is going to live there without pumping some water. It will certainly take more water. Is he here now? (Laughter).

CHAIRMAN: If no other delegates have any questions to ask Mr. Bark, I will ask Mr. Conklin to make an announcement.

Reeve CONKLIN: Mr. President, ladies and gentlemen,—I wish to get an expression of opinion concerning the trip this afternoon. The gentleman in charge of the automobile ride this afternoon is anxious to know how many will partake of that ride, and so far as the Board of Control is concerned, we will be very glad to have every delegate and their friends here accept that ride, but our friends at Summerland are anxious to have you there, so it is a matter for you to decide. I would ask those going to kindly stand up. Thank you.

CHAIRMAN: I believe that Mr. Mutch has an announcement.

Mr. MUTCH: Mr. Chairman, I don't expect much attention after the very interesting discussion we have had, because all I have to say is that the committee in general charge ask me to announce that at nine o'clock this evening there will be a banquet tendered to the delegates from outside points. I don't like the term 'foreign delegates' but that has been used only, however, to distinguish delegates from outside points from those in Penticton. On leaving the hall this afternoon, Mr. Dynes and myself will be at the door and the formal admission invitation to this banquet will be furnished to the delegates by the Secretary.

CHAIRMAN: The Secretary announces that the standard certificates are ready and should be exchanged for tickets before night. The next item on our programme is an address by Mr. C. E. Whistler, Managing Editor, Fruit and Produce Distributor, Portland, entitled:

THE CARE AND CULTURE OF APPLES AND OTHER FRUITS.

Mr. WHISTLER: Mr. Chairman, ladies, gentlemen and cousins,—I have had the pleasure of a number of times addressing audiences through various parts of the western portion of the United States, but I may say this is the first time I have had the great pleasure of addressing an audience under the fostering care of two flags. (Applause). I am glad to see it such. It betokens a great deal, and this is certainly an auspicious moment for the display of a flag and the appreciation of what that flag means to every true hearted citizen. (Applause.) It is a time to-day when we are prone to talk a great deal about the question of patriotism and love and sentiment and wave aside as it were for the time being those things which really demand careful consideration. We hear a great deal of the man who says 'Under no consideration will I ever again go to war' and how I wish we all could carry it out. Now friends, there is a thing that is worse yet than going to war and that is existing in a state of living hell, and that is what prompts us and the heart of every true patriot to swell with pride at his native flag. I have little respect for any man whose heart does not swell with pride at his native flag, (applause) and I can fully realize how that flag is just as dear to you as this flag is to me, and I only appreciate you the more for it, because it shows in your heart a solidarity without which a nation amounts to nothing. Let us then have that feeling down in our hearts, not so much to do great things as to know that right must win. (Applause.) You people up here, of course, are much more interested over the present situation, perhaps, than we are, but with us it certainly is a very grave matter for the reason that all the world is getting badly mussed up and we don't know what the answer is. In fact, it brings to mind the suggestion contained in the story that when a certain John Oats married a lady named Lizzie Wheat, the band serenaded them with 'What shall the harvest be? (Laughter).

But I am here to talk peaceful measures, for none of us has yet been compelled to beat our pruning hooks into swords, and our avocations must go on, because without our agriculture industries, our other great industries must soon come to nothing and we might revert to barbarism, which I say is worse than war and I quote the words of Brutus 'Who among you is so base that he would be a slave?' and doubtless you answer 'None, Whistler, none.'

Now, my mission this afternoon is the biggest subject I have ever tackled in my life, if you will just notice all my subject—"The Care and Culture of Apples and other Fruits," (cultivation, insect pests, smudging, harvesting, packing, shipping, etc.)—and it kind of makes me wonder just what you think I am. It has been said that there are three requisites to every good sermon; first, the text; next, getting away from it; third, staying away from it; but if I were to stay away from my text, I could not very well talk about fruit at all. I do not know just what phase would interest you the most. I am mighty pleased to visit your section and I must pay a little tribute to the people up here for the industry they have shown. They have certainly harnessed the forces of nature and are making it serve them. Your conditions seem to me to be looking quite favourable for a profitable production and a happy life. I don't know when I

ever took a trip that enthused me more than the ride down the lake last Monday, and being met at every station by happy looking people. I don't know whether they were all dressed up to see us or what, but they were as nice a looking bunch of young people—boys, girls, women and men—as I ever saw, wherever I have driven. (Applause.) It was a pleasure and I am impressed with the idea that such a personnel as there is in this valley is going to win, however strong may be the current. I don't want, however, to raise your hopes unduly, because I am not a real estate man. They have done enough of that—they have done enough of that. I will tell you right now, friends, there are two potentialities at work to-day that are mitigating against your interests; the-get-rich-quick fellow and the man who is too lazy to work and do the best there is in him; that is lack of potentiality, but we have that all along the line. There is the man who has bought his orchard and paid a big price for it and hung a lot of bouquets on himself, and then curses the industry by losing his interest in it because it don't come back a hundred fold; and there is the other man, the man who has simply been taken in by believing stories and has become disgusted with it, and let it go.

Every horticulturalist has got to fight, but it is a fight of pleasure to the man whose heart is in it and whose only rewards are standing at the top. The man who wishes to be a horticulturalist must be built something along those lines. He must be something of a hunter, not to play sporty, but to take the bitter with the sweet and figure that when he makes something, he will make enough to cover some of those lean years, and he must have enough of other support to take care of him in those lean years. He is going to get lean years and he must fortify himself. He must be a philosopher, because there are some big rewards in the horticultural business, and I am not so pessimistic as those who believe that the zenith of this industry has passed; not by any means. It means more intensive work and rooting out that which is not of the highest quality. I have visited practically every fruit section west of the Rocky Mountains in the United States and I have found one condition; that the experimental stages have always been disastrous, but that they have got the answer in the long run. Too many valleys have been planted under adverse conditions and they have had to experiment to find out that type which was best adapted to the locality.

I will say this to you; I have never visited a fruit section in my life that was not more particularly adapted to some special line of fruit than to general lines of fruit. You may have a district that will grow some varieties of apples par excellence, and many other varieties, apparently similar, may be a failure. Some other section may utterly fall down on the same varieties and produce something else, and no one section have I ever seen that will produce all varieties to the highest state of development—never, never, never. That is naturally expensive to find out. You can take some sections where Newtown Pippins are pre-eminently the leaders and it would be almost useless to try Winesaps. That is a problem and if you have not yet solved that question here, you are not ready for high-class horticulture. You must solve that question, and I trust you are doing that.

Now, I have had experience in various lines of horticulture, beginning in Colorado in the peach business and someone asked me yesterday if I could tell you how a peach orchard was ever made to sell at $4,000 an acre. Many people

thought that all a myth. It is not. That is true, and it came just as naturally as the exploiting of your own valley. However, I did not sell that orchard at that price. I sold it when it was two years old and sold it on the 10th June for $1,060 cash money an acre, and when it was four years old it was sold for $4,000 an acre. How is it possible? Well, let me tell you, whenever you will have a series of high priced products for two or three years in succession, the people are going to go wild. That is one of our failures. They become too easily stampeded. We did have a year in peaches when we sold a carload of peaches in New York City for $2.05 a box. That brought the grower $2 a box. The same year we sold sixty carloads at $1.50 a box right on our station. Now, we had a bumper crop and when you begin to take 2,000 boxes of peaches off an acre at $1.50 a box,—Phew! get your lead pencil and figure out the value of that land, and then do something like that next year and it will drive the people just wild. There was $880,000 worth of land changed hands in a strip seven miles long and three miles wide from the 1st of January to the 1st April and there were only three pieces as big as forty acres. I had a small tract of six acres that I sold this man and I planted it out as perfectly as I knew how to and used the triangle in setting it. I had trimmed them all artistically and it was certainly pretty. Now, as I say, the people were simply going wild and that price was paid. However, the man that got it has gone broke, (laughter) and he is to-day working in a coal mine.

Now, I don't know whether you are interested in pear talk or not. Perhaps you are not heavily engaged in that. The problems of pear production are similar to those of apples. The planting is much the same and the cultivation is much the same, although it differs in different sections. We prune our pears very similar to what we do our apple trees. but I want to say something about pears and efficiency in preparation of your fruits for the market. I don't wish to boast. I don't admire the man who boasts about what he does. I don't know why any man should boast about being careful, but I sent a carload of pears down to New York City that sold for the highest price of any carload of Oregon pears, six and a half cents a piece for every pear in the car and there were 44,564 pears in the car, sold at auction. How did that come ? Well, there was a place that was willing to pay for merit, and a demand that can be reached any time. New York City and your big centres have always got the capital and the men who stand ready to invest in that which has the highest possible merit in it. I took great pains with that orchard, used intensive cultivation and went over it nineteen times. I used no alfalfa or cover crop and the ages of the trees were from eight to twenty years. The season was a most propitious one, very fine, and we put up thirty-two car loads. I took especial pains with that carload, wrapped them in half boxes. I was down in New York later on and found some of my pears in the market. I kept myself unknown to the dealer and asked if he had any Oregon pears. He said, "Yes, fine ones," and my brands were brought in. I said, "You call that good, do you ?" He said, "Yes, sir, the finest ever. I paid pretty high for those." "Do you make any money out of these ?" He said, "I never made as much money off a car of fruit in my life," and I was getting quite interested. (Laughter.) I said, "What class of trade do you find for them?" He replied "Here is an order for the Grand Plaza Hotel," an eleven million dollar hotel, and as near as I could find out, those fellows

paid fifty cents apiece for every pear they ate. (Laughter.) I said "My name is Whistler," and he said "I am glad to see you, glad to see you" and we had quite a little love feast. I said, "I am going to send a car down this fall that will bring more money still." He said, "How?" I replied, "I am going to put them up a little nicer," and he responded, "Well, I'm the man who's going to buy them." It is a question largely of preparation, but unfortunately I did not have the crop that season that I had the year before.

Now, that is simply to impress upon you the question of careful selection. When we first got the idea of putting up fancy package, the man who owned the orchards before me, took the precaution to put up fifty half boxes in plain wrapping paper, such as is seen in the ordinary package, and then he turned around and filled up the other fifty boxes with nice lace paper, packed them with printed wrappers around each pear and altogether put up a very fancy package. He sent them altogether and advised his dealer to note the effect on the market. All the difference between the two boxes was a matter of about nine cents and the work, and the fancy style brought one dollar a box more than the other. Since that time, we have followed out the practice of putting up the best stuff in a good package, and we still continue to do it, and still think it pays. I'll tell you fellows, the people in New York have the money and they don't want it like anybody else, and I am willing to do the work if they are willing to pay for it. (Laughter.) When the returns came back. I was speaking to the buyers of our company in town and said, "What do you suppose he has done with our pears to get such a fancy price?" A nice old Englishman listening nearby said "If you will allow me to interfere, perhaps I can tell you." I said it would be great information to me. He says, "Of course, I don't know, but it is my opinion that those pears have been purchased by a chef and have been placed in storage for the Manhattan Club, of which I am a member. We instructed our chef to buy the best. To belong, a man must have a millilon dollars, and I presume your pears are there." But I found out they were not there, although it gave me an idea.

It will be strange if you are not at times a bit apprehensive about the frost. I have noticed its effects in Colorado, Utah and Southern Oregon. There are many, many ways to combat the ravages of frost, from offering prayers that the Lord would protect the orchard, from that up to rubbing a substance on the north side of the tree. (Laughter.) An old man was incensed with me because I would not try it. He said that if I would just try it, I would be convinced—from that on up to various lines of smudging and heating. Smudging has several ideas in view, some to raise the heat and others to produce a smoke that will mitigate against the effects of the sun. For the purpose of producing a good smoke, manure and damp hay have often been used. We have produced some of the greatest smokes with oil, crude oil, and it will make such a smoke that it is hard to see. It has raised a question in my mind as to its effect upon pollenation. I would like to investigate this question because it is unsolved as yet, but it does this, according to the time when you are doing the smudging. If it should come on before the heavy blooming, I know that it does produce a dense covering over the pistils, which may effect pollenation. There is a point there. We have had a very heavy drop in this past season, even when we felt that the

temperature had been kept high. They thought I had done a perfect job, but later on the fruit dropped and evidently some of it was not pollenated. This season we used about 225,000 gallons of crude oil at an expense of five cents a gallon. In Bear Creek orchard alone, we burned 30,000 gallons of oil and the crop was not heavy. If smudging is done after pollenation has been effected, it cannot very well be injurious.

Coming to the question of apples, our district is one of Newtowns and Spitzenbergs. We pay little attention to anything else. The question of marketing, perhaps, is of interest, although there may be many others. I do not know just what your systems of marketing are, or that I would have very much to suggest if I knew. We are pretty well up in the air as yet in the States and our conditions are not just as I would like to see them. Now, I don't know how well you are organized, whether your systems are through packers, or consignment to commission men, or whether you have representatives at each of the large centres throughout the Northwest, whereby you can check your fruit and know the market. But I presume that you are still in a state of considerable chaos relative to that, and that is very vital, as Mr. Bark has said—a matter of vital importance. Now, complaints often come back on shipments of fruit, giving you a bad order on your fruit. It is very easy to write a bad order and knock off on account of fruit arriving in bad condition. Unless you have some line on your fruits, you are pretty apt to have that come in very frequently, but we are getting past that in the States, and if you have not passed it here, you have a nice lesson to learn in how to take care of your fruit. We have an agency in the States, and I am not telling secrets. It is far reaching and effective. It operates the Producers' Detective Association or Agency, wherein there is an agency operating in the producer's interest, and if a bad order comes into me and I have reason to think it is not bona fide, for $5 I can have any car of fruit examined, any place in the United States, and get an authentic report. It costs a small fee to become a member, but I know that a heavy percentage that used to come in, when they were run down, we found not to be bad orders at all. (Applause). We have sent men a number of times right to headquarters and dragged up the evidence, and they have come to us many times and been ready to give us a bonus. That is the way to do business with those fellows. Of course, I don't know the character of your fruit and it may be that your fruit arrives in bad order, but for every bad order you do send out, you get about four or five back. Maybe I am wrong. I hope your people are a hundred times more honest. (Laughter.)

Now, I have taken up more than my time and I don't know whether I have interested you. If you are not in touch with this last point, it is worth all the time you paid to listen to me. Maybe you have something that beats it. I hope you have, but it is a matter of prime importance. Now, I'd like to have some questions. (Applause.)

Mr. KNIGHT: I would like to ask a question in connection with the Sunkist oranges. I understand that Association is trying to increase the demand because of the extraordinary increase in production, and that they are trying to get persons to use oranges every day of the week. Is that a regular method, and is it feasible to apply it to apples?

Mr. WHISTLER: That has some high virtue. There is a great deal of that done and they have extended their orange trade. One method was to put a premium in each box, a silver spoon, which greatly helped to stimulate the demand. Then, they had the doctors advise that oranges were good for the health, all such work as that, and they have increassed largely the consumption of oranges. I think it might be a good idea to do it here with apples, because I think they are very good for the consumer. They are healthy and could be well advertised on those particular grounds.

Mr. BULMAN: Do you know if that agency you speak of operates in Canada?

Mr. WHISTLER: I think not. It is known as the Produce Reporters' Agency. I do not think it operates across the line.

Mr. WINSLOW: No, they don't.

Mr. TAYLOR: Could you tell us at what age Newtowns start bearing?

Mr. WHISTLER: I have often been asked what age these come into bearing, but there is much in connection with conditions. I must know that before I can answer the question. It is like asking when will a boy learn to swim? In the Hood River district, a man will say seven to eight years old, but elsewhere the time may be ten to twelve before the crop is considerable.

Hon. PRICE ELLISON: What success have you had with co-operative principles and general selling agencies?

Mr. WHISTLER: It depends a whole lot on the men. Some will say one thing and some another. We have had various experiences. As a whole, I think they have been quite profitable. I believe in organization. I cannot help feeling that the individual is but a ship on a rocky billow. It has not all been a success, although a great advancement has been made. It is a slow process. In California when they organized the citrus union, it took many years before they were able to perfect the organization. They had to get sixty per cent of all the product before the organization ever amounted to much. Until they did, they could only follow the price set by the predominating amount of stock offered, but when they got the sixty per cent, the other fellows had to come under their umbrella, and it was quite comfortable.

Mr. SMITH: Allow me to supplement that answer with this statement. First, those sections where they have had the best organizations have been able to sell their product at the best prices, at prices twenty-five to thirty-three and a third per cent higher. Next, every time we get into difficulties with some method of organizing, we learn by experience and are able to avoid the same mistake a second time. Our system is getting a little more widespread, safer and better and just a little more satisfactory year by year, and we are thoroughly convinced that the future of the fruit industry depends upon the extent and character of the co-operative organizations. (Applause.)

Mr. JOHNSTONE: I would like to ask if it is necessary to employ more than the wholesalers in selling fruit; if it is necessary to pay the jobber's price ?

Mr. WHISTLER: We have them in the United States and do the same. No, it is not necessary, but you must have a very thorough working organization to meet that proposition. Of course, if you have a few carload lots of your own you might be able to avoid the jobber, but he will give you an awful run for your money. Now, I am a commission man or a jobber, that is for instance (I am not, thank the Lord) (Laughter), and I am handling your fruit and I know that another man is going into a certain market that I wish him to keep out of, I take your fruit and meet him down there and break that market, and I have not lost anything and broke him, and you paid the expenses. (Laughter.)

Mr. JOHNSTONE: You believe that with a good organization you could do without the jobber ?

Mr. WHISTLER: Yes, sir.

Mr. JOHNSTONE: Thank you.

Mr. WHISTLER: What I mean is, you have your own jobber, that is what you really come to. You do not need to retail here and there.

Mr. JOHNSTONE: Exactly.

A DELEGATE: Have you any special method of inducing fruit growers to join the organization ?

Mr. WHISTLER: Just by letting them know that they are losing money by standing out, that is all you can do. Just present the facts and show them that they are standing in each other's way by not co-operating. That is the only thing I know of, to induce a man to come to his own rescue.

A DELEGATE: I ask that question because I understand, I believe, we have several of our leading fruit growers in this district who are not in the organization.

Mr. WHISTLER: Well you cannot force a man. All you can do is to show that you are able to perfect an organization that has a better working principle, that will beat his, perhaps. (Hear, hear.) Experience will prove the best teacher.

Mr. SMITH: Another thing we have to combat among the confounded Yankees; there are men so thoroughly dishonest that they cannot get into the co-operative association because they do not believe there are any honest men anywhere in the country.

Mr. CONKLIN: At what particular stage of the bud or blossom is the greatest liability to frost, or when do you smoke ?

Mr. WHISTLER: When the weather gets threatening. If the weather is not threatening, we would not smoke, but the greatest danger period is right at the pollenating period which lasts, owing to climatic conditions and the variety of fruits, from four days to seven days. That is the vital period.

Mr. A. H. HUNTLEY: I would like to ask Mr. Whistler if he could kindly help us on co-operation. As already intimated, gentlemen we greatly respect have built up a large trade dealing directly with retailers for a number of years before we commenced co-operation. They have come in and fallen out. How could we get them to believe it is really the best thing ? They are not very far from you this afternoon and I for one am very anxious to have them know that co-operation is the best step they can take. If you can convince them, you will be doing a great deal for Penticton, Mr. Whistler. (Laughter.)

Mr. WHISTLER: I certainly recognize the situation fully, but in a time of war, treaties do not amount to much. Those men probably came in on some certain agreement. Alright, they may have seen an opportunity to make more by jumping out and the dollars were too big and they did so, not fully realizing that if all did the same it would kill their goose for them. The idea is to get together and all live and get down together and secure what that old flag there represents—solidarity. (Applause.) A man must understand that he has got to live and fall with his neighbours. (Hear, hear.)

CHAIRMAN: Mr. P. H. Eraut, Chairman of Municipal Irrigation, Penticton, is going to tell us something about the system which we are going to visit.

MUNICIPALLY CONTROLLED IRRIGATION.

Mr. P. H. ERAUT: Mr. Chairman, ladies and gentlemen,—I will endeavour to give you a short description of our municipally owned irrigation system and the manner in which it is operated by us. It is one of two systems owned and operated by a municipality in British Columbia. It was thought by a number of people, at the time it was purchased from the Southern Okanagan Land Company in 1910, that it could not be operated by the municipality to the satisfaction of the users and continue to be self-supporting. Time has proved the contrary, the system paying its way almost from the time of its purchase from the land company. Penticton's irrigation system was installed about nine years ago by the Southern Okanagan Land Company, to irrigate their tract of some 5,200 acres. The cost of the system to the municipality was $90,000, the money being raised by the issue of debentures bearing five per cent interest, which the company took over at par in payment for the system. The system itself comprises two units, situated on Penticton and Ellis creeks. There is a dam on each creek about two miles up from the town, at an elevation of 425 feet above the level of Okanagan lake, where the head-gates are situated. The capacity of the Penticton gate is 800 miner's inches, and the Ellis gate, 1,035. There are, altogether, thirty-five miles of flume, 10½ miles of open ditch and five miles of pipe, which extends four miles north and four miles south of the town and about

two miles in width. The water is delivered to the highest point of the user's land. Measuring boxes, as used by the most private corporations, are unknown, the user obtaining all the water he wants and when he wants it. We have not, up to the present time, known what it is to be short of water, although apart from the irrigation we supply domestic water for a population of about 3,000, also an electric light plant, a cannery and the Kettle Valley roundhouse. Our reservoirs are situated as follows: One on Penticton creek and two on Ellis creek, with an additional two sites on the latter creek. Penticton creek reservoir is situated about 18 miles up the creek at an elevation of 5,280 feet, its capacity being 185,000,000 gallons; should occasion arise, it can be enlarged to hold a total of 700,000,000 gallons. Ellis creek reservoirs are situated about fourteen miles up the creek at an elevation of about 4,800 and 5,400 feet respectively, above sea level. Their combined capacity is 115,000,000 gallons. The watershed is about 180 square miles and the northern slopes being heavily timbered, retard melting of the snow till late in June. The usual time when it is found necessary to draw on the reservoirs is from July 18 to August 5, according to the season. Repair and replacement work, including caulking of flumes and other necessary details, is commenced about the 1st of March each year. This work usually lasts a month. The policy of the council, when removing old flumes, is to replace, wherever possible, with iron pipe or work of a permanent nature. Water is turned on the 1st of April, although the irrigation season proper does not commence until May 1. During this month, the first irrigation work is begun. Some of the patrons of the system leave their initial irrigation work until June, while others, who only irrigate once a year, turn on the water in July. The irrigationists usually require from four to six days (of twenty-four hours each) at each irrigation period, during which time the water flows continuously. It is customary in this locality to give two such waterings. A greal deal, however, depends on the nature of the soil and the cultivation it receives. Very little work of this nature is done in August, as it tends to prolong the growing season too long, endangering the new wood on the fruit trees not yet hardened to stand the winter. On August 31, the irrigation season proper terminates, though water is left running in the flumes for accommodation of those desiring it for domestic purposes. This is continued until November 15, when the flumes are drained and the plant closed down until the following spring. The rates charged per annum to users of irrigation water is $3.25 per acre. This rate covers sinking fund, interest, management and upkeep. In the operation and care of the system, two men are employed for six to eight months respectively, and one man to care for reservoirs during flood season, at a wage of $125 a month and provide his own horse. The duties of the two men comprise inspection of the entire system under their charge every day, regulating the quantity of water in flumes, detection and repair of leaks and damage, supplying consumers with water when required and reporting regularly to the Chairman of the Irrigation Committee. For a time it took a considerable amount of trouble and patience to educate the water users to the fact that they must not molest or tamper with their own or any other water gate. They were under the impression that, it being a municipally-owned system,

they could use the water at their own convenience. This would have entirely disorganized the system, rendering the water supply erratic and no end of difficulty and trouble entailed. Everything, however, is now running smoothly and the purchase of the irrigation system by the municipality is admitted by all to have been one of the best achievements of the municipality since the incorporation of Penticton in 1909. In operating the system the council appointed a committee from themselves and they in turn appoint a chairman who is responsible for the proper management of the system. The chairmanship of the irrigation committee is no sinecure and is quite an honorary office. In the new B.C. Water Act, there are several advantages to a municipally-owned system, viz., representatives are elected for a term of years who are users of the water, whereas in a municipally-owned system, the members are elected each year, and members representing town wards have no knowledge of irrigation, thus the system is liable to suffer by change of policy or lack of knowledge. Penticton has been fortunate so far in having its system controlled by the same head for the last four years. (Applause.)

Mr. CRANDALL: In riding over the irrigation system, we find in many places the pipe runs under the track. How do you take care of the water when the frost comes in the fall ?

Mr. ERAUT: We often tap and let the water out under the crossings, but the Kettle Valley people take entire charge of that. We have nothing whatever to do on their right of way. They are responsible if anything should happen.

Mr. CRANDALL: How late do you turn if off, and how early in the spring do you turn it on ?

Mr. ERAUT: We start construction the 1st of March and keep it up for a month and the water is turned on the 1st of April and continues until the 15th or 20th November and probably into December.

CHAIRMAN: We will now hear the final report of the Committee on Resolutions.

Mr. PEARCE: Mr. President, and members of the Eighth Annual Convention of the Western Canada Irrigation Association: The Committee on Resolutions has striven to keep in view the chief aim of the Association and believes that object can best be attained by passing on to it those resolutions only which relate strictly to the purposes of the Association or in which those purposes largely predominate; preferring to leave alone local association matters or those outside of the main object of this Association. To determine where to draw the line is difficult, particularly as one's sympathies are aroused at first by what appear to be grievances. Many of these, however, may be, on investigation relieved by reference to the law as it at present exists, or by some slight amendment thereto.

By such action, we hope to contribute our small quota towards checking the insane mania at present existing that most, if not all, of our ills or wrongs, can be cured or mended by legislation.

Therefore, we beg to report:

Resolution Number One does not come within the proper scope of this Convention.

At the same time, if the representations made regarding the practical working out of the Railway Act, so far as it affects the expropriation of land for the railway, or the assessment of damages arising out of the construction and operation of the same be correct, it would appear that some changes might with advantage be made, so as to expedite an equitable settlement. We therefore beg to refer this phase of the matter to the attention of the legislature, which alone can deal therewith.

Resolution Number Two. Your committee cannot see its way clear to approve the crux of this, viz., ownership by any individual of trees planted on a public highway. We would, however, commend both to the Provincial Government and that of the Municipality, that it is particularly desirable that every encouragement should be given to the planting on such highways of trees, shrubs and flowers, both for shade and ornamental purposes.

Resolution Number Three. The mover and seconder have withdrawn this, believing that the Water Act of the province grants ample protection in this matter.

Resolution Number Four. As to this resolution, the mover and seconder have withdrawn it, and desire us to substitute the following resolution therefor, and which this committee endorses.

Whereas it is acknowledged that the so-called dry belts of British Columbia are among the most important fruit-growing centres of Western Canada; and

Whereas the development of these districts along horticultural and agricultural lines to the maximum area profitable and at the earliest date is essential; and

Whereas this development depends on an adequate supply of water for irrigation purposes;

Be it resolved that it is in the public interest that investigations be carried on as speedily as possible, with a view to the Government eventually considering the policy of constructing dams and storage reservoirs, if it is found by such investigations that there is sufficient land reclaimable, as will justify the work, and produce a revenue that will in the course of a reasonable time return the cost of construction and maintenance.

Mr. PEARCE: I will move, seconded by Dr. Dickson the adoption of this report of the Committee on Resolutions.

CHAIRMAN: You have heard the report and its adoption has been moved and seconded. What are your wishes? Carried.

Mr. PEARCE: There is another resolution handed in, which I will read.

Moved by R. C. Regler, seconded by Charles McCordy:

Whereas the thanks of this Association are due to the Dominion Government of Canada and to the Provincial Governments of British Columbia and Alberta for their financial assistance and hearty encouragement; and

Whereas consideration was given to the thought of abandoning the meeting of the Association for the present year, owing to the present troublous times; and;

Whereas the above-mentioned governments coincide with the opinion of the Executive of this Association relative to the holding of the International Irrigation Congress at Calgary, October 5 to 9, 1914, and with the view that anything calculated to be a help to agriculture would be a help not only to Canada but to the Mother Country;

Therefore the Western Canada Irrigation Association in convention assembled, takes this opportunity to assure the Dominion and Provincial Governments of its unswerving loyalty to the Mother Country and also to assure them that it considers no sacrifice too great to make to keep the British Empire intact.

(Loud applause.)

CHAIRMAN: Evidently it is the wish of the Convention that the last resolution be embodied with the report as adopted.

Moved by Mr. Huckvale, seconded by Mr. Pearce:

That this Association, in convention assembled, desire to express their appreciation and to extend their heartiest thanks to the Reeve and Council, the Board of Trade, the President and officers of the Aquatic Club and the people generally of Penticton for their unbounded hospitality and kindness, and last but not least, to Mr. J. J. Warren, President of the Kettle Valley Railroad, for his kindness and in placing a train at their disposal and showing them the wonderful engineering feats and scenic beauties of his road. Carried.

CHAIRMAN: That will also be embodied in the report.

Mr. CONKLIN: Mr. President, ladies and gentlemen, on behalf of the Muncipality and the committee as a whole, I assure you it has only been a

pleasure to take the steps we have and I sincerely hope that you have all enjoyed and appreciated our efforts.

CHAIRMAN: Mr. Reeve, I am truly sorry that the chairman is not an orator and equal to the occasion so that I might tell you how much we have all appreciated your hospitality.

Mr CRANDALL: It seems to me at this time, when bouquets are in season and being flung to those who have done so much towards the success of our meeting that a word would not be out of place calling the attention to the great labour and success which have been put forth by Mr. Rankin and his able assistants. (Applause.) I don't think there is one person realizes the amount of labour entailed upon these gentlemen and the great industry and good judgment used by them to make this Convention a great success. I feel each one of us owes them a debt of gratitude and I think expression should be given thereto for their loyalty to their work. (Applause.)

CHAIRMAN: I trust the official reporter gets this last little speech down.

A DELEGATE: I believe that the last resolution offering thanks to Penticton ought to be amended to include Summerland for the kindly efforts which they put forth,

CHAIRMAN: It seems to me this is a good suggestion and if there is no objection, the chair will see that it is inserted. (Applause.) I believe that Mr. Rankin wishes to bring up one point

Mr RANKIN: I wish to say that I have received the following letter from Mr. J. Robert Brown, Indian Agent at Vernon, B.C., dated July 16th, 1914:

DEAR SIR,—

Replying to your circular letter enclosing form of certificate of appointment of delegates, I beg to say that as there is apparently no provision made for Indian Agents being appointed as delegates, I am unable (much as I would like) to be present at the forthcoming convention to be held in Penticton, as a delegate. I attended the conventions held in Kamloops and Kelowna and was deeply interested, not only on my own account, but also on account of my wards, but I think some provision ought to be made so that Indian Agents can attend the conventions of the Association as delegates.

Yours respectfully,

J. ROBERT BROWN.

I replied to this as follows, under date of July 21st:

DEAR MR. BROWN,—

I have your letter of the 16th instant and sincerely regret to note that our basis of representation makes no special mention of an Indian Agent, but you would come in under the heading of "Foreign Delegates" and I write this special letter on behalf of the Executive to invite you to be present as such. If you will please fill out the memorandum half of the Certificate of Appointment and return it to me, retaining the other half, which you should bring with you to Penticton, the matter can be brought up as an amendment, so that hereafter provision can be made for the Indian Office.

Please accept my compliments, and assuring you that I look forward with great pleasure to seeing you at Penticton, I remain

Yours very truly,

NORMAN S. RANKIN.

I may say that Article X of our Constitution says: "The Constitution may be amended by a two-thirds vote of the delegates present at any annual convention, provided notice of the proposed amendments shall be mailed to the Secretary at least one month prior to the Convention, and that notice of such amendments shall be incorporated in the official call."

I received this letter one month before but I was delinquent in not bringing the matter to your attention through the Official Call. If it is the wish of the gathering, it would require a two-thirds vote to make it right, and I would also suggest that members of the Dominion Water Power Branch be included.

CHAIRMAN: What are your wishes? Shall we amend the Constitution so that the gentlemen mentioned shall have a chance to be represented as delegates?

Moved by Mr. Johnston, Kamloops, seconded by Mr. Pegler, Bassano, that the Constitution be amended accordingly so as to include Indian Inspectors and Agents from Saskatchewan, Alberta and British Columbia, the Superintendent of the Dominion Water Power Branch of the Department of the Interior and one representative from the Water Power Branch; one from the British Columbia Hydrographic Survey and one from the Manitoba Hydrographic Survey. Carried.

CHAIRMAN: The next item on the programme will be the election of officers for the forthcoming year. The following officers were then elected:—

Hon. President—The Honourable Dr. Roche, the Minister of the Interior.

President—The Honourable Duncan Marshall, the Minister of Agriculture for the Province of Alberta.

Vice-President—Dr. C. W. Dickson, Kelowna, B.C.

Second Vice-President—William Pearce, Calgary, Alberta, and Chairman Executive Committee.

Executive:

R. C. Pegler, Bassano, Alta.
F. H. Peters, Calgary, Alta.
W. Huckvale, Medicine Hat, Alta.
W. H. Fairfield, Lethbridge, Alta.
James Johnston, Nelson, B.C.
William Young, Victoria, B.C.
Arthur Chamberlain, Kamloops, B.C.
J. C. Dufresne, Penticton, B.C.
Permanent Secretary, Norman S. Rankin, Calgary, Alberta.

CHAIRMAN: The next order of business is the selection of a place of meeting for the Convention in 1915.

PLACE OF MEETING.

As the result of representations then made by the delegates, it was moved by Mr. Dufresne and seconded by Mr. Huckvale, that the Ninth Annual Convention of the Western Canada Irrigation be held at Bassano in 1915. Carried.

Representatices from Kamloops and Medicine Hat also announced that their districts would bid for the annual convention in 1916 and 1917 respectively.

Mr. WHISTLER: Gentlemen, I know you are anxious to withdraw but there is something in my heart that must come out before we adjourn this splendid meeting. For me to say I have enjoyed myself does not really express the feeling within my heart. I certainly have enjoyed the pleasure of this experience, of the intercourse and exchange of ideas, and I appreciate fully the interest you are taking in the great problems of life. Now, then, I am President of the Oregon State Horticultural Society. We meet in the month of December and I want to extend to you the kindest invitation to come down and hear us and help us, and we will endeavour to make you feel as I have felt here. (Applause.)

Mr. HUCKVALE: I would like to express on my own behalf and, I take it for granted, of this Convention, our great regret that Mr. J. S. Dennis has not been able to be present. He has probably done more to further the success of this Association than any other single man in the country. (Hear, hear.)

I am sure his absence has been entirely unavoidable this time and I would like, Mr Chairman, if you would allow the placing on the minutes of this meeting the regret of this Convention at his absence this year. (Applause.)

CHAIRMAN: I am sure we all cordially endorse what Mr Huckvale has said. No one has worked harder or helped more in our Association, or for irrigation, perhaps, than Mr. Dennis.

Mr. PEARCE: I would like to include in that the Hon. Mr. Ross.

CHAIRMAN: The expressions shall be entered on the record accordingly.

Motion for adjournment is now in order.

Moved by Mr. Pearce, seconded by Mr. Dufresne, that the Convention now adjourn. Carried.

A meeting of the new Executive was held in the Incola hotel, Penticton, B.C., August 19, 1914, at 9 p.m., Mr. Peters being the only absentee.

Mr. Pearce was elected to the chair, and the reading of the minutes of the previous executive meeting was dispensed with.

Moved by Mr. Pegler, seconded by Mr. Huckvale, that a meeting of the Executive be held at Banff sometime in December next, at the call of the Permanent Secretary. Carried.

Moved by Mr. Fairfield, seconded by Dr. Dickson, that Messrs Marshall and Peters, and Messrs. Ross or Young and the Secretary, be appointed a delegation to attend the next meeting of the Oregon Irrigation Congress at Portland. Carried.

Moved by Mr Huckvale, seconded by Mr. Chamberlain, that the Executive attend the meeting of the International Irrigation Congress to be held at Calgary in October, 1914. Carried.

The meeting then adjourned.